SPILLER #2

EXHIBIT COPY

QFCI

Date: 19/05/11 JM

Exhibit Number: 432

2ND STATEMENT OF DANIEL SPILLER – COPY

Supplementary statement by Daniel Thomas Spiller, affirmed on 17 May 2011

1 I, Daniel Thomas Spiller of Level 15, 53 Albert Street, Brisbane, Queensland, the Director, Operations, of the SEQ Water Grid Manager (**Water Grid Manager**), affirm the following:

2 In this statement to the Queensland Floods Commission of Inquiry, as required in the letter to me dated 26 April 2011 (**letter**), I:

(a) have provided all the information in my possession and identify the source or sources of that information; and

(b) make commentary and provide opinions I am qualified to give as to the appropriateness of particular actions or decisions and the basis of that commentary or opinion,

(c) in relation to the matters outlined in topics 3, 4, 5, 6, 7, 8 11, 12, 13, 14, 15 and 16 of the letter.

3 I address each of those topics separately below. The remaining topics in the letter are addressed in my first statement sworn 13 May 2011, to which I refer. In particular, I refer to paragraphs 4 and 5 of that statement, which are equally apposite to this statement.

Signed:.....[redacted]..... Taken by:[redacted].....
Daniel Thomas Spiller ~~[Justice of the Peace~~/Solicitor]

TOPIC 3: A REQUEST BY THE HONOURABLE STEPHEN ROBERTSON MP, THEN MINISTER FOR ENERGY, MINES AND NATURAL RESOURCES ('the Minister') MADE BY LETTER DATED 25 OCTOBER 2010 TO THE SOUTH EAST QUEENSLAND WATER GRID MANAGER TO INVESTIGATE THE PROSPECTS OF REDUCING THE LEVELS OF WIVENHOE, SOMERSET AND NORTH PINE DAMS

4 In the text that follows, I have provided the extent of my recollections about my interactions with various people in connection with the Minister dated 25 October 2010. For the purposes of providing this account, I have refreshed my memory by rechecking my emails, letters and other documents. Insofar as they are relevant to this topic, copies of those emails, letters and other documents are annexed to this statement as **Annexure AA**, save for those documents which are, or which could be, the subject of cabinet confidentiality. I have included in the annexure of a list of those documents in that category. To the extent that the documents are subject to cabinet confidentiality I understand that Crown Law will, on instructions, either produce them to the Commission or take objection to their production. Those documents which are not subject to cabinet confidentiality will be produced by me to the Commission separately.

5 Whilst relevant only as to context for this topic, I consider that it is important to note that I had been working extensively with Mr John Bradley, the Director-General of the Department of Environment and Resource Management (**DERM**), and others prior to 20 October 2010 on advice for the Minister and the Treasurer as to the optimal operating strategy for the desalination facility at Tugun and the Western Corridor Recycled Water Scheme.

Signed: [redacted]
Daniel Thomas Spiller

Taken by: [redacted]
[~~Justice of the Peace~~/Solicitor]

6 That process had commenced in a meeting I attended (with Mr Dennien) on or about 22 July 2010, a few weeks after I commenced work for the Water Grid Manager. That meeting was with officers from Queensland Treasury and DERM and the Chief Executive of WaterSecure (the owner of the desalination plant at Tugun).

7 In that meeting, officials from Queensland Treasury and DERM advised that the Minister and the Treasurer had sought advice about whether or not it would be possible or prudent to demobilise one of the facilities or reduce their operating levels in light of increased water levels in the South East Queensland Water Grid (**Water Grid**) in around the middle of 2010.

8 On 27 July 2010, Treasury officials provided me with a draft letter from the Minister and the Treasurer. I provided comments on the draft that day.

9 The formal signed letter was ultimately sent and received on 13 September 2010. However, work was ongoing from 22 July 2010.

10 Once we received the initial request in the meeting on 22 July 2010, the Water Grid Manager relied upon WaterSecure, for its advice. It provided that advice, which informed the advice from the Water Grid Manager.

11 Ultimately, that was a process which we adopted with the request from the Minister dated 25 October 2010 and which is discussed below; namely that the asset owner (in the case of the desalination plant, WaterSecure, and in the case of the reduction of Wivenhoe and Somerset Dams, Seqwater) was asked for advice about aspects of the Minister's request. The reasons that the Water Grid Manager participated and led

Signed: [redacted]..... Taken by: [redacted].....

Daniel Thomas Spiller ~~[Justice of the Peace/~~Solicitor]

some of these discussions was, in my opinion, that the Minister's request impacted upon the provision of water security in accordance with the System Operating Plan, made by the Queensland Water Commission (**QWC**), and the fact that the Water Grid Manager was responsible for the optimal operation of the Water Grid as a whole.

12 As such, and whilst the Water Grid Manager was not in a position to provide specific advice about the Ministers' request insofar as it related to the specific assets, it was necessary that the Water Grid Manager consider the asset owners' advice in formulating the optimal operating strategy for the Water Grid as a whole, and to ensure that the Ministers were appropriately advised about the impact of any recommendations or advice provided by asset owners.

13 Ultimately, the work in relation to the desalination facility and the recycled water project in response to the 22 July 2010 request culminated in advice from the Chair of the Water Grid Manager dated 12 November 2010. On 5 December 2010, the Minister announced that the desalination facility would be placed in standby mode and part of the Western Corridor Recycled Water Scheme would be demobilised.

14 That is important context as it explains, in my view, why Mr Bradley telephoned me when following a request from the Minister on or about 19 October 2010 for advice in relation to options for reducing dam levels, a topic which is discussed further below. In my view, Mr Bradley logically called me as the request was similar to the work that we had previously been doing.

15 The first I knew of the request by the Minister for the Water Grid Manager to investigate the prospects of reducing the levels of Wivenhoe, Somerset and North

Pine Dams was when I received a telephone call from Mr Bradley. My recollection is that Mr Bradley had telephoned me on his mobile phone whilst he was walking down George Street. Mr Bradley said words to effect that he had just been asked by the Minister about whether, mindful of forecasts, flood risks and impacts could be reduced by drawing down storage levels in the dams. To the best of my recollection, this discussion occurred in the morning of 19 October 2010.

16 I recall that Mr Bradley asked me, in our discussion, to draft a Matter to Note for the Minister about this, together with a letter from the Minister formally requesting advice. A Matter to Note is effectively a one page summary that the Minister could take to Cabinet in order to raise the issue in general discussion. I understand that the form of the Matter to Note is dictated by Cabinet.

17 At about 3.30pm on Tuesday, 19 October 2010, Mr Dennien attended a meeting with the Minister, his advisers and Mr Bradley regarding the Water Grid Manager's advice about the operation of the desalination plant and Western Corridor Recycled Water Scheme. The meeting was scheduled that morning. I did not attend the meeting. Mr Dennien told me, in summary, what had been said in the meeting shortly after it. I do not have any particular recollection of the detail of that now. I have a passing recollection that the request for advice about options to draw down dam levels was discussed at the end of the meeting.

18 Later, at about 5.20pm on Tuesday, 19 October 2010, I received an email from Mr Dennien in which he outlined a range of actions that I was to coordinate the next day (as he was to be interstate). These actions included drafting a letter from the Minister

to Mr Peter Borrows (the Chief Executive Officer of Seqwater) requesting some analysis of the flood risk benefits of reducing water supply levels below Full Supply Level as a pre-emptive action for the wet season. Actions in relation to the advice about climate resilient supplies were also outlined. These actions related to the impacts of placing the desalination plant in standby mode over the 2010/11 wet season while completing further analysis in relation to demobilisation options.

19 I recall that this advice had become timely, due to public discussion regarding the role of the desalination plant with dams overflowing (for example, see the *Gold Coast Bulletin* article of 12 October 2010). As of 19 October 2010, our advice and supporting report were well progressed. However, WaterSecure was continuing to refine key inputs and consultation with the QWC was ongoing.

20 In the morning of Wednesday, 20 October 2010, I requested the template of the Matter to Note from [redacted] Manager of Cabinet and Parliamentary Services for DERM. He provided the template by email at 7.59am, along with a previous example.

21 At about 12.35pm on Wednesday, 20 October 2010, I sent an email to Mr Bradley confirming my understanding of the outputs that he required. Among those outputs was a Matter to Note that addressed the options to temporarily reduce storage levels and the status of advice regarding the operation of the desalination facility and Western Corridor Recycled Water Scheme.

22 In that email, I sought his approval to consult Seqwater in relation to the options for their dams and, alternatively or as well, Messrs John Ruffini (an employee of DERM)

and Bob Reilly (General Manager of the Office of the Water Supply Regulator). I also inquired as to whether an indicative media release would be required, as a demonstration of how the policy decision may be explained. I did the latter within the context that there had been extensive discussion in the media about maintaining Wivenhoe Dam at above Full Supply Level.

23 At 1.09pm on 20 October that same day, Mr Bradley replied to me and a group of officers from his department. In that email, Mr Bradley:

(a) confirmed that the Matter to Note was required from me by close of business the following day (Thursday, 21 October 2010). I understood that this timeframe was to enable it to be discussed at Cabinet the following week;

(b) requested that Mr Reilly coordinate the preparation of a range of letters, including two for the Minister to sign. These letters were to be sent by close of business on Monday, 25 October 2010 for the Minister's signature, following consultation with Seqwater, Sunwater and me. I understood myself to be responsible for drafting a letter from the Minister seeking advice about options to temporarily reduce the storage levels of key dams. I understood Mr Reilly to be responsible for the other letters, which related to a range of regulatory matters for which he is responsible; and

(c) that the indicative media release was required from me, though a deadline was not specified.

24 Following that email chain, I had a telephone discussion later that day with Mr Reilly. I talked to Mr Reilly about his view of the Minister's request given his role as the

Regulator of the Dams, the fact that the Minister was concerned about reducing the risks of flooding and the most appropriate way of tackling this. I sought his feedback as to the process generally. We discussed what the options could be. We discussed two potential objectives, one being a small reduction of the water levels in the dams and one being a large reduction (in that order). Mr Reilly mentioned that a small reduction, in the order of 95% of Full Supply Level, may have some benefits. We agreed that this type of reduction was likely to minimise inconvenience to local areas due to local bridges being inundated. My recollection of the discussions is that Mr Reilly did not have any scientific basis for making the 95% reduction, it was merely a 'gut feel' reaction from him based on his experience. Mr Reilly and I discussed that we did not know what the benefits would be in terms of major flood impacts. We also discussed the possibility of a larger reduction. We agreed that this would need further modelling and advice from experts. I cannot now recollect who originally suggested this latter aspect in the discussion.

25 I note that the System Operating Plan, under which the Water Grid Manager operates, sets critical risk criteria for the purposes of assessing water security. The System Operating Plan also contains a range of operating rules. It is made by the QWC. The Water Grid Manager regularly reports to the QWC on its compliance with the System Operating Plan.

26 From current storage levels, the critical criteria relates to the risk of the twelve key Water Grid storages falling to 40% of combined capacity within five years, triggering the reintroduction of Medium Level Restrictions and the use of purified recycled w[redacted]r to augment Wivenhoe Dam. The maximum acceptable risk of that occurring is

Signed:[redacted]..... Taken by [redacted].....
Daniel Thomas Spiller [Justice of the Peace/Solicitor]

5%. Anything under a 5% risk is deemed to be acceptable from a water security perspective. This is set out in the System Operating Plan, for example in section 7 of version 3.2.

27 In essence, the Water Grid Manager makes its decisions based on water security across the Water Grid as a whole (including the twelve key storages) based on medium-term assessments, and not at any given point therein.

28 In late October 2010, the probability of the twelve key storages falling to 40% of combined capacity within five years was well below 5%. This security was due to completion of new infrastructure, dams being near capacity and ongoing water efficiency.

29 In particular, inflows (in October 2010) had filled Wivenhoe and Somerset Dams to 100% of their Full Supply Levels for the first time in many years. That, together with the prospect of a very wet season, gave a significant amount of comfort as to water security for any proposal to make a small reduction in water levels in the dams.

30 There was a deal of comfort on my part, based on the work that we had done, that temporarily drawing Wivenhoe and Somerset Dams down to 95% of their Full Supply Level would have a very small impact on the risk of the twelve key Water Grid storages falling to 40% of combined capacity within five years (that is, such releases would have no impact on the ability of the Water Grid Manager to continue to comply with the risk criteria contained in the System Operating Plan).

Signed:[redacted]..... Taken by:..[redacted].....

Daniel Thomas Spiller

31 I did not need to arrange for any further studies to be conducted in connection with a temporary reduction of the Wivenhoe and Somerset Dams to 95% of their Full Supply Levels, as the Water Grid Manager had previously done a great deal of work in relation to water security across the Water Grid. Much of this work had been undertaken in August and September 2010, when Wivenhoe and Somerset Dams were at around 95% of their combined storage capacity. This work related to the preparation of the second version of the Water Grid Operating Strategy and of the advice to the responsible Ministers in relation to the operation of the Western Corridor Recycled Water Scheme and the desalination plant. That is discussed above.

32 I have a passing recollection that Mr Reilly and I also discussed our understanding of the tasks that we had been allocated by Mr Bradley, and the process by which we would collate those.

33 Following my discussion with Mr Reilly, I telephoned Jim Pruss from Seqwater. I think that was in the evening of 20 October 2010. I had a short conversation with Mr Pruss that was similar to the conversation I had with Mr Reilly. I explained the Minister's request. I recounted what Mr Reilly and I had discussed - in that there were two sets of objectives, being the minimisation of inconvenience to local areas and the cutting-off of local roads and what could be done about major flood impacts. I recounted to Mr Pruss that we felt that a temporary reduction to 95% of Full Supply Level would have some benefits for local convenience and asked his views on that.

Signed [redacted] .....
Daniel Thomas Spiller

Taken by: [redacted] .....
[Justice of the Peace/Solicitor]

34 In the discussion with Mr Pruss, we agreed that a temporary reduction to about 95% of Full Supply Level could be useful for the purpose of minimising local disruption without any significant detriment to water security.

35 Mr Pruss stated to me that he saw some value in the dams being reduced marginally to something like 95% of Full Supply Level. He noted that there could be operational benefits reducing the frequency of dam operations, thereby reducing operating costs and enabling key staff to focus on 'real' events.

36 Mr Pruss, to my understanding, had previously been the manager of Redlands Water, which was responsible for the operation of the Redlands City Council water assets. The management of water supply from Leslie Harrison Dam had been within his remit in that role. He recounted to me, in this discussion, that his understanding was that Redlands Water had operated Leslie Harrison Dam in a similar manner, reducing storage levels slightly to minimise inconvenience to local areas. The reference in the letter from the Minister to the Leslie Harrison Dam came from Mr Pruss' discussions with me on this occasion (as I drafted the letter for the Minister at Mr Bradley's request, see below).

37 Mr Pruss stated that, beyond that, he would need his personnel to model whether or not there would be any benefit in terms of flood mitigation.

38 I advised Mr Pruss that I expected the Water Grid Manager would get a letter from the Minister to formally consider these options and that the Water Grid Manager would, in turn, write to Seqwater seeking its advice.

Signed [redacted] .....
Daniel Thomas Spiller

Taken by [redacted] .....
[~~Justice of the Peace~~/Solicitor]

39 The next morning, Mr Pruss arranged a brief discussion with Mr Rob Drury (Dam Operations Manager for Seqwater) and me at short notice. Beyond the matters that we had discussed the previous night, I also briefed Mr Pruss about the advice being provided about the climate resilient supplies and sought his comment. At some point – to the best of my recollection, in that conversation, but it may have been in a later conversation within a few days – Mr Pruss provided some comments, based on his experience, about the operational challenges involved in recommissioning a water treatment source once it had been demobilised. This is the extent of my recollection of our meeting.

40 In an email chain related to setting up the meeting, Mr Pruss advised that he had discussed the concept of drawing down dams with his Chief Executive Officer (Mr Borrows) and Mr Drury and that there was general agreement that it could be done and that it would help operationally and with public impacts.

41 I also telephoned Mr Ruffini to discuss the Minister's request. I believe that was around 20 or 21 October 2010. Between about 2005 and 2007, while at the Office of Urban Management and later at the QWC, I had done a lot of work with Mr Ruffini including in developing the system yield model for the Water Grid and in the development of the Water Strategy generally. Mr Ruffini had done much of the thinking behind the model and its application, such as through the risk criteria described in paragraph 26 above. In my view, he had a significant amount of relevant expertise.

Signed: [redacted] .....
Daniel Thomas Spiller

Taken ~~by~~: [redacted] .....
~~[Justice of the Peace/~~Solicitor]

42 I told Mr Ruffini the same things I had previously told Mr Reilly and Mr Pruss. I recall that he also indicated that he was generally comfortable with the idea of the dams being temporarily reduced to approximately 95% of the Full Supply Level.

43 Late on Wednesday, 20 October 2010, I briefed Mr Bradley on my outline of the content of the Matter to Note, informed by the above conversations. I cannot recall the detail of that conversation.

44 At 9.18am on Thursday, 21 October 2010, I provided a first draft of the Matter to Note to [redacted] by email, with a note that it was subject to consultation with Mr Reilly about dam operations. [redacted] had requested an update on its status the previous evening. Mr Dennien commented on the draft prior to my providing it to [redacted]

45 At 11.35am, Mr [redacted] (one of Mr Robertson's advisers) requested an update on whether the Water Grid Manager would be able to provide a progress report on options for the future operation of the desalination plant, as discussed with the Minister on the preceding Tuesday. At 11.41am, Mr Bradley replied advising that he had discussed the advice with me and that I was working on a Matter to Note for close of business that day.

46 At 12.25pm, I provided, by email, a copy of the draft Matter to Note to Mr Reilly for comment (having removed the text relating to climate resilient supplies). I have a passing recollection that I rang Mr Reilly beforehand to advise that I was sending the draft and that I required urgent comment.

Signed:... [redacted] .....
Daniel Thomas Spiller

Taken by: [redacted] .....
itor]

47 At 1.31pm, Mr Reilly provided comments in tracked change, copied to [redacted] (then Deputy Director General, DERM). The comments reflected the latest status of the draft communications protocol for dam releases, which I was not involved in drafting.

48 Throughout this period Mr Dennien and I continued to consult with officers of WaterSecure and, to a lesser extent, Queensland Treasury and the QWC about the proposed advice regarding climate resilient supplies. Officers from Queensland Treasury were primarily interested in accounting and contractual issues with the operator.

49 I subsequently refined the draft. In parallel, [redacted] (Water Grid Manager Director, Communications) iteratively prepared the draft media release in consultation with Mr Dennien and me. During that process, from time to time, I incidentally discussed with Mr Dennien what I was doing in that regard.

50 At 5.18pm, I provided the updated Matter to Note to Mr Bradley by email, with copies to Mr Dennien and Mr Reilly.

51 At 5.48pm, Mr Watts advised by email that the Minister had requested that the Matter to Note not propose a decision about the operation of the desalination plant. He advised that it should provide the latest information on desalination plant options and a brief update on the process that the Minister and the Treasurer had initiated. As indicated in the email, and expanded upon in a subsequent conversation, the purpose of the delay was to provide time for all of the analyses to be completed and to ensure that the Minister was available to speak publicly to any announcement once it was

Signed: [redacted] ..... Taken by [redacted] .....

Daniel Thomas Spiller [Justice of the Peace/Solicitor]

made (I understood that he was scheduled to travel overseas immediately after the Cabinet meeting on 25 October 2010).

52 I replied at 6.02pm, in order to confirm that the Matter to Note was still required to address the options in relation to drawing down key dams. Mr Watts replied confirming this.

53 At 5.26am on 22 October 2010, I emailed from my home email address a revised version of the Matter to Note to Mr Bradley with a copy to Mr Dennien. This email followed email exchanges with [redacted] at 3.45am and 5.00am that morning, where [redacted] inquired as to its status.

54 I subsequently emailed a series of updates to this version, due to my errors in controlling versions. In particular [redacted] commented on a version sent at 7.50am, requesting that I use text that reflected his request of the previous evening and that I address the review of dam operating levels before operation of the desalination plant. Prior to the version sent at 8.41am, I also omitted to include the text from Mr Reilly (refer paragraph 47). The content of the discussion of the review of dam operating levels did not change between these versions.

55 At 8.40am, I circulated a final version to [redacted] with copies to various others.

56 I received no advice as to whether the Matter to Note was amended, or written outcomes of any subsequent Cabinet discussion. However, through subsequent conversations with [redacted], Mr Dennien and I confirmed that a formal request for a review of dam operating levels would be forthcoming.

Signed:.. [redacted] .....
Daniel Thomas Spiller

Taken by: [redacted] .....
[~~Justice of the Peace~~/Solicitor]

57 I have a passing recollection that I had a discussion with Mr Reilly that morning, having completed my involvement in the Matter to Note. I recall that I apologised for the omission and that we discussed how we would compile the letters. He advised that he would prepare a covering brief and provide a draft to me for comment. I advised that I would focus on the letter and media release.

58 At 2.11pm, Mr Reilly provided a copy of the draft brief for comment. He also requested that the letter and indicative media release be provided by 3pm.

59 At 3.32pm, I provided the letter and indicative release directly to [redacted] from the Deputy Director General's office by email. I did so as I had been unable to provide them to Mr Reilly prior to his deadline. I was also unable to comment on the draft brief within his deadline. My email was copied to Mr Bradley, Mr Reilly, [redacted] and Mr Dennien.

60 At the same time, I drafted a letter from the Water Grid Manager to Seqwater. Based on my discussions with the people referred to above on or about 20 October 2010, everyone agreed that Seqwater was the entity that needed to provide the requisite advice about options to temporarily reduce the storage levels of key dams and the benefits that might flow from those. Seqwater was the asset owner and operator.

61 On 25 October 2010, the Minister wrote to the Chair of the Water Grid Manager, Mr [redacted] in the terms proposed.

62 In that letter, the Minister sought advice as to whether there was an opportunity temporarily to reduce the volume of water stored in key dams in preparation for the

Signed:.[redacted]..... Taken by:.[redacted].....
Daniel Thomas Spiller [~~Justice of the Peace~~/Solicitor]

upcoming summer season. In doing so, the Minister noted that recent releases from Wivenhoe Dam (in October 2010) had resulted in significant inconvenience and isolation for residents in some downstream areas. The Minister sought a response by the end of November 2010 as to the available options and likely benefits.

63 On 25 October 2010, I wrote (by email) to Mr Pruss, copied to Mr Dennien, advising that we understood we would receive a letter requesting advice as to available options and likely benefits of releases from dams, including Wivenhoe, and stating that that letter would be forwarded as soon as possible.

64 The Water Grid Manager also communicated the likelihood of the letter arriving from the Minister to the QWC by way of an email dated 26 October 2010 at 7.37am from Mr Dennien to Ms Karen Waldman (the Chief Executive Officer of the QWC). I understood from discussions with Mr Dennien that this email was sent as a courtesy and because the Minister's request had the capacity to impact upon the over-arching strategy for the management of the State's water resources (a matter within the Commission's remit).

65 I understand that on 28 October 2010, Mr Dennien forwarded to Ms Waldman a copy of the Minister's letter by email.

66 On 2 November 2010, Mr Dennien wrote to Mr Borrows (the Chief Executive Officer of Seqwater) confirming that the Minister had sought urgent advice about whether the volume of water stored in dams could be reduced as a means of reducing the severity, frequency and duration of flooding in downstream areas. I drafted that letter for Mr

Dennien. Mr Dennien enclosed a copy of the Minister's request and sought Seqwater's advice by 19 November 2010.

67 During the period from 20 October 2010 until the formal response to the Minister on 24 December 2010, I had regular discussions with Mr Dennien about the Minister's letter, the response from Seqwater and the advice from the Water Grid Manager. I cannot now recollect each individual discussion, or the words used in those discussions or the effect of them. Mr Dennien and I talk on a daily basis in our roles for the Water Grid Manager and we did discuss this subject on many occasions during this period.

68 On or around 10 November 2010, Mr Pruss provided me, by email, a draft advice by Seqwater's dam safety experts. I subsequently forwarded a copy of that email to Mr Dennien. The document from Seqwater examined a range of different scenarios for temporary reductions of the water levels in Seqwater's gated dams in order to provide flood mitigation benefits. Amongst other things, the advice noted that, for major flood events impacting on urban areas, it was unlikely that peak water levels in Brisbane would be significantly impacted by minor reductions in the level of the Wivenhoe Dam and that reductions in dam volume in the order of at least 250,000 megalitres would be needed to provide any significant reduction in water level peaks experienced in urban areas. That advice also noted that such reductions would not necessarily guarantee reductions in urban flood levels because the distribution of rainfall in the Brisbane River catchment governed the extent of possible urban flooding.

Signed:... [redacted] .....
Daniel Thomas Spiller

Taken by:.. [redacted] .....
~~[Justice of the Peace~~/Solicitor]

69 On about 16 November 2010, I was in Canberra for a workshop which was also attended by Mr Pruss. At a dinner he commented to me, in passing, that he considered that the first response given by Seqwater may not answer all the questions and may need some more work. He expressed a view that they (Seqwater) were keen to meet with us and discuss our views as to where it went from there.

70 At around that time, I had modelling done by Gilbert and Sutherland, independent contractors to the Water Grid Manager, who assisted with hydrological modelling for the assessment of water security risks. That modelling (which is done on the model which the Water Grid Manager has on licence from the QWC) was solely on the possibility of a reduction to 95% of Full Supply Level. Whilst we had previously done a lot of work, I wanted specifically to confirm that the risk of proceeding to 40% of Full Supply Level in the immediate future was less than 5% if the levels of Wivenhoe and Somerset Dams were reduced to 95% of their Full Supply Levels.

71 Before the Water Grid Manager could determine the water security impacts, it needed advice from Seqwater about the options and the potential benefits of those options. The potential benefits had to be weighed against the increased risks to water security (even if the risks were small). This is equivalent to the process applied in relation to the climate resilient supplies, wherein the Water Grid Manager did not pre-empt or constrain options considered by WaterSecure.

72 The Water Grid Manager did not model the water security impacts of alternative draw downs at that time. There was no point to that until Seqwater decided what parameters or options it wished to test or adopt. In the absence of instructions on the

parameters or options by Seqwater, I chose to focus my modelling resources on the finalisation of advice about climate resilient supplies and the proposed second version of the Water Grid Operating Strategy, both of which were important tasks and being completed at that time. For my purposes it was sufficient that the water security related modelling could have been done promptly when Seqwater advanced the matter. I knew that that modelling could be done promptly.

73 However, I note that the general water security position had already been outlined in detail in widely available documents, including the final SEQ Water Strategy.

74 Further, even if the water security impacts were small, costs would have needed to be considered. If options provided by Seqwater had a significant impact on the probability of key Water Grid storages falling to, for example, 40% of combined storage capacity, the increased costs of operating the desalination plant and implementing other additional water security measures would need to be considered.

75 On or about 18 November 2010, Mr Dennien asked Mr Pruss and Mr Drury to attend a meeting on 23 November 2010, at the offices of the Water Grid Manager, in order to discuss the draft advice provided by Seqwater on 10 November 2010 and the response to the Minister's letter. To the best of my recollection, Mr Dennien made that invitation by having his personal assistant send an invitation in Outlook to those gentlemen (and me). The invitation was sent on 18 November 2011, most likely after Mr Dennien's personal assistant had agreed upon a suitable time with Mr Pruss' assistant.

Signed:..... .....
Daniel Thomas Spiller

Taken by .....
[~~Justice of the Peace/Solicitor~~]

76 That meeting occurred in the office of Mr Dennien at the Water Grid Manager on 23 November 2010, commencing at or around 4.00pm. To the best of my recollection, the meeting was approximately one hour in duration. Mr Pruss and Mr Drury attended from Seqwater and Mr Dennien and I were the attendees from the Water Grid Manager. To the best of my recollection, at the meeting:

(a) Mr Drury dominated the discussion insofar as Seqwater was concerned. He spent a significant amount of time explaining or speaking to their opinion, as was summarised in their preliminary report provided on 10 November 2010;

(b) in essence Mr Drury summarised much of what was in their written report provided on 10 November 2010;

(c) after that was done, Mr Dennien asked a series of questions focusing on events where the water flow out of the dams was greater than 3,500 cubic metres per second (which Seqwater had nominated as larger flood events in their preliminary paper);

(d) Mr Drury drew a diagram on the whiteboard in Mr Dennien's office. In essence, that involved drawing a triangle with the longer edge of the triangle resting horizontally and the point facing upwards. I do not recall the exact words that Mr Drury used but my recollection is that the effect of what he said was that even if there was a significant reduction from the dam, it was unlikely to make any difference to the peak flow downstream. I recall that in the diagram, Mr Drury 'cut off' the left hand side of the triangle, indicating that a large reduction in the water levels in Wivenhoe and Somerset Dams may delay

the onset of water releases, but it would not change the peak water flow downstream;

(e) I recollect that Mr Drury said that a large reduction in the dam would not change whether or not there was 'mud in the houses' in Brisbane;

(f) in addition, Mr Drury said words to the effect that if pre-releases were made from the dam immediately prior to major inflows, there was a risk that, in a situation like a 1974 flood, you would have large releases from the dam coinciding with the king tide or significant rainfall in the catchment area below the dam, making potential floods worse. This was given as one example of the types of complex interactions that would need to be modelled in detail;

(g) Mr Drury also drew another diagram on the board that illustrated this potential situation, showing a triangle representing Wivenhoe Dam, a squiggly line showing the Brisbane River and then various arrows showing where the weather system could coincide with releases from the dams. My recollection of what he said was that it could be predicted that the rain would fall on the dam, but it could move and hit the river at the same time that the releases did, thereby worsening the situation;

(h) Mr Drury said that Seqwater was not in favour of doing pre-releases immediately prior to a potential flood event, because of the unpredictability of the weather systems, the tides and the confluence of all of these events;

(i) my recollection is that Mr Drury concluded his answers to Mr Dennien's questions by saying words to the effect that these were very complicated

Signed: [redacted]..... Taken by: [redacted].....

Daniel Thomas Spiller [~~Justice of the Peace~~/Solicitor]

questions and required a significant study that would take in the order of six months to do; and

(j) at the conclusion of the meeting, Mr Pruss and Mr Drury promised that they would provide further information to us shortly after the meeting. I understood that this would occur fairly quickly, given that a deadline of the end of November 2011 that had previously been posed in the correspondence to the Water Grid Manager and, through it, to Seqwater.

77 On 1 December 2010, Mr Dennien emailed Mr Pruss and Mr Drury following up on the discussions on 23 November 2010 with regard to dam levels and flood impacts and advised that we were due to respond to the Minister by the end of November.

78 On 2 December 2010, Mr Drury sent me, by email, (copied to Mr Pruss and Mr Borrows) a draft report.

79 On 3 December 2010, Mr Dennien responded, by email, to Mr Drury (copied to Mr Pruss, Mr Borrows and me) asking several further questions about the draft report and, in particular, asking for clarification about the impacts and benefits of medium and large releases from the dams for large flood events and about the modelling that had been done as to those issues.

80 At some point in early December 2010, on a date I cannot now recollect, I had a discussion with Mr Bradley about our response to the Minister's letter dated 25 October 2010. My recollection is that Mr Bradley and I were discussing another topic and he asked me how we were going with a response to the Minister. I advised

him that we were still waiting on a response from Seqwater and that we were chasing that up. I cannot now recollect anything else about that discussion.

81 On 8 December 2010, Mr Dennien emailed Mr Pruss and Mr Drury (copied to Mr Borrows and me) seeking a response to the earlier queries Mr Dennien had asked.

82 On 9 December 2010, Mr Drury sent an email to Mr Dennien, (copied to Mr Pruss, Mr Borrows and me) responding to the questions that had earlier been asked.

83 The next relevant event was a board meeting of the Water Grid Manager on 13 December 2010, which was attended by Minister Robertson and [redacted] I was in attendance at that meeting. To the best of my recollection, at the board meeting:

(a) There was a reasonably lengthy presentation regarding the OCA Incident Manager system and how the Water Grid Manager was now equipped to manage emergencies. That involved the presentation of a number of case studies to the Minister to show him how OCA Incident Manager worked.

(b) My estimation is that the presentation went for approximately 15 minutes.

(c) After that I estimate that Mr Dennien spoke for approximately 15 minutes summarising the advice that we had received from Seqwater and, informed by that, our response to his request of 25 October 2010. I made some comments. I cannot now recollect exactly what Mr Dennien said, or what comments I made. However, to the best of my recollection, the effect of what was said was that:

Signed:[redacted]..... Taken ~~by~~ [redacted]

Daniel Thomas Spiller ~~[Justice of~~ [redacted] Solicitor]

(i) Mr Dennien explained there two different types of situations had been contemplated, one involving small release to something like 95% of Full Supply Level and the other involving larger releases;

(ii) Mr Dennien explained, insofar as small releases were concerned, the Seqwater advice about what could be achieved by a temporary reduction to 95% of the combined storage levels of Wivenhoe and Somerset Dams. To the best of my recollection, we said that our advice would be that we had no objections to such releases;

(iii) insofar as major releases were concerned, Mr Dennien stated that Seqwater had recommended that further study was required and that any benefit would require the release of approximately 250,000 megalitres. Mr Dennien also spoke about the advice he had received from Seqwater about the unpredictability of rainfall in terms of where it might occur and when and the difficulty in estimating whether or not there would be any benefit from that order of change to the levels in the dams and what the costs would be;

(iv) Mr Dennien said that Seqwater's advice had been that releasing water upfront to lower the water levels would defer the need for major releases, but would only change storage level and peak outflow rate in a very small subset of flood events;

(v) I stated that there hadn't been a major release (defined by Seqwater as being in the order of 3,500 cubic metres per second) since Wivenhoe

Dam had been constructed and thus the chance of major flood event needed to be considered in making decisions as to these matters; and

(vi) Mr Dennien said that Seqwater's advice had been that there should be no change to the Manual at this time and that a process needed to be followed prior to making decisions about major releases. He also added that he considered that further work was required.

84 On 24 December 2010, Mr Humphrys wrote to the Minister, responding to his letter dated 25 October 2010, regarding the possibility of releasing from key storages in anticipation of major inflows. That advice was based upon information provided by Seqwater. The letter advised the Minister that the Water Grid Manager and the QWC had confirmed that drawing down of Wivenhoe and Somerset Dams to 95% of their combined Full Supply Level would have negligible effects on the ability of the Water Grid Manager and the QWC to provide water security for South East Queensland. In the advice attached to the letter, the Water Grid Manager advised that Seqwater had confirmed that any impact to allow additional flood mitigation potential would require Wivenhoe Dam releases of at least 250,000 megalitres. The Minister was advised that such a release may have potential water security impacts and that a more detailed investigation was recommended, to be led by Seqwater and involving the Bureau of Meteorology, the Councils and the Water Grid Manager. Mr Dennien had provided, by email, a copy of the draft advice to the QWC for comment prior to it being sent to the Minister.

Signed:.....[redacted]..... Taken by:.....[redacted].....

Daniel Thomas Spiller [~~Justice of the Peace~~/Solicitor]

85 On 24 December 2010, Mr Dennien also wrote to the QWC by email requesting its approval for a letter to go to Seqwater advising that Wivenhoe and Somerset Dams' levels could be reduced to 95% of their combined Full Supply Level for flood mitigation purposes. That approval was provided to Mr Dennien by email at approximately midday on 24 December 2010.

86 Mr Dennien also subsequently wrote to Seqwater to confirm the instructions provided. This advice was provided by email at approximately 2.32pm on 24 December 2010.

TOPIC 4: ANY ACTIONS BY THE SOUTH EAST QUEENSLAND WATER GRID MANAGER IN RESPONSE TO TOPIC 3 ABOVE

87 I have covered the actions by the SEQ Water Grid Manager in my response to Topic 3.

TOPIC 5: ANY DOCUMENT PRODUCED BY QUEENSLAND TREASURY, THE SOUTH EAST QUEENSLAND WATER GRID MANAGER, QUEENSLAND WATER COMMISSION, SEQWATER OR ANY OTHER BODY ABOUT THE COST OF POTENTIAL REDUCTIONS IN THE LEVELS OF WIVENHOE, SOMERSET AND / OR NORTH PINE DAMS BETWEEN 1 OCTOBER 2010 AND 31 MARCH 2011

88 To the best of my knowledge, there is no document that has been produced by Queensland Treasury, the Water Grid Manager, the QWC, Seqwater or any other body about the specific cost of potential reductions in the levels of Wivenhoe, Somerset and/or North Pine Dams between 1 October 2010 and 31 March 2011.

89 However, I should make clear to the Commission that a significant amount of work had historically been done by the Water Grid Manager in determining the potential costs of a reduction in the 12 main dams which are part of the Water Grid and which supply the majority of the urban areas of Brisbane with water. Wivenhoe and

Signed:[redacted]..... Taken by:[redacted].....

Daniel Thomas Spiller

Somerset Dams are approximately 50% of the combined storage capacity of these 12 dams.

90 In the period between July and October 2010, I had worked extensively with the Queensland Treasury and DERM, principally through my contact with Mr Bradley, about the economic impact of the desalination plant, the cost associated with the reductions in dams in the Water Grid generally and other matters. These matters are addressed in paragraphs 5 to 13 of this statement.

91 In relation to a temporary draw down, additional costs will be incurred should the 12 dams not refill prior to an extended period of low inflows. These low inflows may cause changes to the operation of the Water Grid, with associated impacts on the operation of the Water Grid. The extent of these changes would depend upon the levels of the 12 key Water Grid storages and upon current and forecast demand. Operational changes may include a combination of:

(a) increasing or reversing transfers across the region, such as between the Gold Coast and central South East Queensland;

(b) increasing production from climate resilient sources, such as the desalination plant;

(c) increasing production from supplies that have been de-mobilised or are being operated at below full capacity, such as the Western Corridor Recycled Water Scheme;

(d) reducing the take from storages that are at low levels.

Signed:[redacted]..... Taken by:[redacted].....

Daniel Thomas Spiller ~~[Justice of the Peace]~~/Solicitor]

92 Major changes will occur when key Water Grid storage levels fall to:

(a) 60% of combined capacity, triggering the operation of the desalination plant at capacity at all times, subject to operational constraints (as defined by the Water Grid Operating Strategy);

(b) 40% of combined capacity, triggering the use of purified recycled water to augment Wivenhoe Dam and the introduction of Medium Level Restrictions (as specified in the South East Queensland Water Strategy and System Operating Plan);

(c) 30% of combined capacity, triggering the construction of drought response infrastructure (as specified in the South East Queensland Water Strategy and System Operating Plan).

93 These medium to long-term cost impacts can be considered as part of the assessment of proposed operational changes, where those changes would have a material impact on the probability of storages falling to the trigger level. These cost impacts are calculated as the change in the probability weighted costs (being the change in the probability of reaching the trigger level multiplied by the additional costs incurred once storages are below that level).

94 The Water Grid Manager undertakes detailed assessments of the cost impact of major changes to the operation of the Water Grid. The advice on climate resilient supplies is one example. Similar operational assessments are currently being undertaken for the Murrumba Downs Advanced Water Treatment Plant, South Maclean Water Treatment Plant and Capalaba demand zone. Like the advice on climate resilient supplies, these

assessments involve a range of non-cost considerations and input from relevant entities.

95 In addition, the Operating Strategy specifically addresses operational costs and measures taken to ensure efficient operation (for example, refer to Section 5.2 of the approved Operating Strategy version 3). Indicative operating costs are calculated each month, when Grid Instructions are prepared. Attached as **Annexure A** is Operating Strategy Version 3 and the relevant approval letter from the QWC dated 15 April 2011.

TOPIC 6: MY ROLE IN RELATION TO THE CREATION OF A DRAFT COMMUNICATIONS PROTOCOL FOLLOWING FLOODING DOWNSTREAM OF THE WIVENHOE DAM IN OCTOBER 2010

96 I had no role in drafting this Protocol. [redacted] (Water Grid Manager Director, Communications) and [redacted] (Water Grid Manager Director, Risk and Technology) provided input on behalf of the Water Grid Manager.

97 On 3 December 2010, Mr Denner provided to me a copy of the final draft Protocol. Mr Denner advised me that the Premier had requested that the parties involved utilise the protocol in its current draft format until the final version was approved.

98 I had previously been sent some emails where the draft protocol was discussed (copies of which are included with this statement as **Annexure B**).

99 From email communications and discussions with Mr Denner and [redacted] I understand that the Protocol was drafted by [redacted] and [redacted] (Emergency Management Queensland). I understand that it was prepared

Signed:... [redacted] .....
Daniel Thomas Spiller

Taken by: [redacted] .....
[~~Justice of the Peace/Solicitor~~]

in consultation with a working group that was chaired by Mr Reilly. The working group included representatives of Seqwater, Councils and the Bureau of Meteorology.

TOPIC 7: DETAILS OF ANY COMMUNICATIONS BY ME WITH THE FLOOD OPERATIONS CENTRE BETWEEN 6 AND 19 JANUARY 2011, VERBATIM WHERE POSSIBLE (ANY COMMUNICATIONS, INCLUDING EMAILS, SENT OR RECEIVED BY ME ARE ANNEXED TO THIS STATEMENT)

100 I assume that the Flood Operations Centre (**FOC**) referred to is that defined on page 2 of the Seqwater Manual of Operational Procedures for Flood Mitigation at the Wivenhoe and Somerset Dams (and particularly revision 7 of that document dated November 2009).

101 During January 2011, I did not have any discussion with the flood operations engineers, except for one teleconference with Mr Borrows where I believe some of the engineers may have been present (but I cannot now be sure). I cannot now recollect the details of that teleconference. I do recall, for the purposes of that teleconference, having received an email from Mr Borrows at the FOC and having sent an email to him at the FOC email address on 15 January 2011. Those two emails are referred to in **Annexure C**. Further, I occasionally received FOC Situation Reports through a third party.

TOPIC 8: MY ROLE IN RELATION TO THE COMMUNICATION OF DECISIONS MADE BY THE FLOOD OPERATIONS CENTRE TO EXTERNAL PERSONS AND AGENCIES BETWEEN 6 AND 19 JANUARY 2011 (ANY CORRESPONDENCE, INCLUDING EMAILS, SENT OR RECEIVED BY ME ON THIS TOPIC DURING THIS PERIOD ARE ATTACHED TO THIS STATEMENT)

102 Apart from what I mentioned in paragraph 101, I did not have any direct communications with the Flood Operations Centre between 6 and 19 January 2011.

Signed:[redacted]
Daniel Thomas Spiller

Taken by:[redacted]
[~~Justice of the Peace~~/Solicitor]

103 Throughout January 2011, I did have extensive communications with other officers of Seqwater in relation to dam releases.

104 My communications primarily involved Mr Drury, who was responsible for sending me Technical Situation Reports (**TSRs**) as required by the draft Communications Protocol. I was primarily responsible for forwarding those to others in accordance with the Protocol. Mr Drury was my point of contact in relation to dam releases. I often spoke to him to clarify aspects of the TSR, prior to its distribution.

105 I had some limited communications about dam operations with other officers of Seqwater, being Mr Borrows (CEO), [redacted] (Acting Executive General Manager Water Delivery) and Mr Mike Foster (Manager Strategic Relations and Communication). Mr Borrows joined the Water Grid Emergency Management Team (**EMT**) (discussed in my first statement) for key teleconferences, including one with Council CEOs at 12.30pm on 9 January 2011. [redacted] was the Seqwater representative on the EMT. He provided some limited advice in relation to dam operations. Mr Foster and his staff provided advice regarding communications and media inquires throughout the event.

106 I cannot now recollect the details of every discussion that I had with Mr Drury and other officers. I believe that the emails and records in the OCA Incident Manager reflect the discussions that we had. I am unable to provide any further details at this time.

107 Copies of my direct communications between 6 and 19 January 2011 relevant to this topic are attached as **Annexure D** save for those documents which are, or which could

be, the subject of cabinet confidentiality. I have included in the annexure a list of those documents in that category. To the extent that the documents are subject to cabinet confidentiality I understand that Crown Law will, on instructions, either produce them to the Commission or take objection to their production. Those documents which are not subject to cabinet confidentiality will be produced by me to the Commission separately.

108 Communications relevant to my statement include:

(a) TSRs provided to me by officers of Seqwater;

(b) TSRs distributed by me;

(c) other information provided to me by officers of Seqwater;

(d) other communications with key Government and external stakeholders; and

(e) communications about media releases and responses to media enquiries, including consultation with officers of Seqwater.

TOPIC 11: MY COMMUNICATIONS RELATED TO THE BUSINESS OF THE SOUTH EAST QUEENSLAND WATER GRID MANAGER BETWEEN 1 SEPTEMBER 2010 AND 31 MARCH 2011 WITH THE FOLLOWING:

109 I attach, as separate Annexures to this statement, copies of all of the emails I have been able to locate with the people referred to below that are relevant to the topics contained in the Commission's email to McCullough Robertson of 28 April 2011 narrowing the scope of the original request and which are not otherwise produced under a specific topic. The annexures exclude communications that are relevant to another topic. To the extent that certain documents are, or may be, the subject of [redacted]vilege or cabinet confidentiality, I have listed them in a schedule

Signed: [redacted] ..... Taken by: [redacted] .....

Daniel Thomas Spiller

within the annexure relevant to the person concerned. I understand the documents which are the subject of Parliamentary privilege have been, or will be, produced to the Commission by Crown Law. To the extent that the documents are subject to cabinet confidentiality, I understand that Crown Law will, on instructions, either produce them to the Commission or take objection to their production. Those documents which are not subject to cabinet confidentiality will be produced by me to the Commission separately.

110 To the extent that certain documents are, or may be, the subject of Parliamentary privilege or cabinet confidentiality, I have listed them in a schedule within the annexure relevant to the person concerned. I understand that those documents will be produced to the Commission by Crown Law.

SUB TOPIC 11(A): MY COMMUNICATIONS WITH JOHN BRADLEY, DIRECTOR GENERAL, DEPARTMENT OF ENVIRONMENT AND RESOURCE MANAGEMENT

111 Copies of the relevant emails with Mr Bradley are enclosed with this statement as **Annexure G**.

112 In broad terms, there were three relevant topics which I was corresponding with Mr Bradley about during the specified period. They are:

(a) the advice regarding the operation of climate resilient supplies;

(b) dam operations, including our (the Water Grid Manager's) functions under the final draft Communications Protocol; and

(c) water supply emergency management, essentially from 10 January 2011.

Signed: [redacted]
Daniel Thomas Spiller

Taken by: [redacted]
[~~Justice of the Peace~~/Solicitor]

113 **Annexure G** includes my emails containing TSRs. It also includes updates on the water supply emergency, which I sent to a similar distribution list. These reports were also distributed to the Minister and his advisers, among others.

114 Mr Bradley was on leave from 25 December 2010 to 10 January 2011. Ms Debbie Best was the Acting Director General for most of that period. To the extent that they are relevant to the topics outlined in the balance of the letter, my emails to and from Ms Best during that period are also annexed in **Annexure G**.

SUBTOPIC 11(B): MY COMMUNICATIONS WITH THE HONOURABLE STEPHEN ROBERTSON MP, MINISTER FOR ENERGY, MINES AND NATURAL RESOURCES AND SUBSEQUENTLY MINISTER FOR ENERGY AND WATER UTILITIES

115 My relevant emails are annexed to this statement as **Annexure H**, excluding the TSRs included in **Annexure G**.

116 My recollection of my communications with the Minister is as follows.

117 I had communications with the Minister in the 13 December 2010 board meeting of the Water Grid Manager.

118 From 25 December 2010, I also copied the Minister into TSRs I was requested to do so by [redacted] who was then one of his advisers.

119 Further, on 10 January 2011, I attended a meeting with Mr Dennien, [redacted] and the Minister at approximately 10.30am. At that meeting, Mr Dennien and I briefed the Minister on the establishment of the EMT and the steps being taken to manage possible threats to water supply. I cannot now recollect the words that we used, or the [redacted] that we used, at that meeting, save that the Minister was briefed

Signed: [redacted] .....
Daniel Thomas Spiller

Taken by: [redacted] .....
[~~Justice of the Peace~~/Solicitor]

about the establishment of the team and the progress of the implementation of the Water Grid Emergency Response Plan.

120 On 31 January 2011, I attended a meeting at which Mr Borrows briefed the Minister on the status of Seqwater investigations regarding options to temporarily draw down Wivenhoe Dam (refer Topic 14).

121 On 13 February 2011, I attended a meeting with the Minister, Mr Borrows, Mr Dennien and Mr Bradley and their advisers immediately prior to the announcement that Wivenhoe Dam would be temporarily drawn down to 75% of its Full Supply Level. The meeting was preparation for a media interview.

SUBTOPIC 11(C): MY COMMUNICATIONS WITH THE HONOURABLE STEPHEN ROBERTSON MP'S MINISTERIAL ADVISORS

122 The relevant emails are annexed to this statement as **Annexure I**, excluding the TSRs that are included in **Annexure G** and the briefing notes that are included in **Annexure H.**

123 To the best of my recollection, my communications were with [redacted]. In particular, I had regular conversations with [redacted] during this period.

124 I cannot now recollect the details of every relevant discussion. I believe that the emails and records in OCA Incident Manager reflect the discussions that we had. I am unable to provide any further details at this time.

SUB TOPIC 11(D): MY COMMUNICATIONS WITH PETER BORROWS, CHIEF EXECUTIVE OFFICER, SEQWATER

Signed:[redacted]..... Taken by:[redacted].....

Daniel Thomas Spiller [~~Justice of the Peace~~/Solicitor]

125 The relevant emails I exchanged with Mr Borrows are annexed to this statement as **Annexure J**.

126 I cannot now recollect any individual meetings or discussions with Mr Borrows that are not referred to in those emails.

SUB TOPIC 11(E): MY COMMUNICATIONS WITH MARY BOYDELL, QUEENSLAND WATER COMMISSIONER

127 To the best of my recollection, I did not have any relevant communications directly with Ms Mary Boydell, the Queensland Water Commissioner, during this period. I was copied into communications between Ms Boydell and Mr Dennien or the Chairman of the Water Grid Manager. The relevant emails I been able to locate are annexed to this statement as **Annexure K.**

128 I attended two meeting with the Chairs and Chief Executive Officers of the QWC, WaterSecure and Water Grid Manager in relation to the advice on climate resilient supplies.

SUB TOPIC 11(F): MY COMMUNICATIONS WITH KAREN WALDMAN, CHIEF EXECUTIVE OFFICER, QUEENSLAND WATER COMMISSION

129 I did not have many relevant communications with Ms Waldman during the relevant period. The relevant emails that I have been able to locate are annexed to this statement as **Annexure L**.

130 In broad terms, there were two relevant topics which I was corresponding with Ms Waldman about during the specified period. They are:

Signe[redacted]..... Taken by [redacted].....

(a) the advice regarding the operation of climate resilient supplies, including the impacts for the QWC modelling of the bulk water price path; and

(b) dam releases, including the advice provided about Hinze Dam on 10 December 2010 and about Wivenhoe Dam on 24 December 2010 and in early 2011.

131 I attended a limited number of meetings with Ms Waldman in relation to the advice on climate resilient supplies. The outcomes of these meetings are reflected in my emails.

132 With Mr Dennien, I attended a meeting with Ms Waldman and key officers in early January 2011. At that meeting, we each explained the advice that we were intending to provide in relation to the water security impacts of temporarily drawing Wivenhoe Dam down to 75% of its Full Supply Level.

133 I also had two other discussions with Ms Waldman that I can now recollect, namely:

(a) First, a discussion on 10 January 2011. In that discussion (which was by telephone), I sought her agreement for specific officers of the QWC to assist Seqwater in the preparation of TSRs. Ms Waldman made [redacted] available. I subsequently offered this assistance to Seqwater (Mr Drury), who advised that this assistance was not required.

(b) Second, I had a discussion with Ms Waldman on 13 January 2011, again by telephone. Ms Waldman called me and offered to participate in the Emergency Manager rotation (discussed in topics 9 and 10 in my first statement) and to

Signed:[redacted]..... Taken by:[redacted].....

Daniel Thomas Spiller ~~[Justice of the Peace/~~Solicitor]

provide any other assistance required. I asked her for advice regarding demand management options, which she subsequently provided by email.

TOPIC 12: THE DISCONTINUANCE OF A STUDY IN RELATION TO POTENTIALLY INCREASING THE FULL SUPPLY LEVEL OF WIVENHOE DAM UNDERTAKEN BY THE QUEENSLAND WATER COMMISSION IN 2010 AND 2011 (ANY COMMUNICATIONS, INCLUDING EMAILS, SENT OR RECEIVED BY ME IN RELATION TO THIS TOPIC ARE ANNEXED TO THIS STATEMENT)

134 The Water Grid Manager was aware of the study in relation to potentially increasing the Full Supply Level of Wivenhoe Dam being undertaken by the QWC in 2010 and 2011, but was not involved in it, or advised that it had been discontinued.

135 The Water Grid Manager has not been invited to be represented on any working group.

136 In late 2010, the Water Grid Manager was provided updates on the project status for the purposes of communications. This included background briefing for media interviews in October 2010.

137 As is discussed above, I was employed by the QWC from approximately October 2006 until June 2010. I was a principal author of the South East Queensland Water Strategy.

138 During my employment with the QWC, the then SEQWater produced a study in relation to potentially increasing the Full Supply Level of Wivenhoe Dam. A copy of the report is annexed to this statement at **Annexure M**.

139 This report informed the draft South East Queensland Water Strategy, released in March 2008. The draft Strategy identified raised operating levels in Wivenhoe Dam

as a potential future water source. It included an action to 'review the operation of the Brisbane River system to optimise the water supply yield and balance flood storage and water supply storage volumes.'

140 While an option, further investigation into increasing the Full Supply Level of Wivenhoe Dam was not a priority for the QWC at that time. This reflects that:

(a) it would not have increased security during the then current drought; and

(b) beyond committed projects, additional supplies were not required until at least 2028, based on water balance modelling contained in the draft Water Strategy.

141 The revised draft South East Queensland Water Strategy, released in November 2009, includes more detail regarding the investigations. It states that investigations would include consideration of:

(a) the impact on the frequency, severity and duration of flooding both upstream and downstream of the dam;

(b) any effect on the structural integrity of the dam and its components or any required spillway upgrades; and

(c) environmental and social impacts including adverse effects on any roads and crossings caused by flooding.

142 The revised draft Strategy clarified that this was considered to be a medium-term priority.

143 The final South East Queensland Water Strategy, released in July 2010, includes no material changes in relation to this option.

TOPIC 13: THE DISCONTINUANCE OF OTHER STUDIES BEING UNDERTAKEN BY THE QUEENSLAND WATER COMMISSION IN 2010 AND 2011 IN RELATION TO POSSIBLE OPTIONS TO INCREASE THE YIELD FROM THE SOMERSET / WIVENHOE SYSTEM

144 I assume that the reference to the 'Wivenhoe and Somerset system' is a reference to the Dams themselves. I do not otherwise know what the 'Wivenhoe and Somerset system' is. That said, so far as I am aware, there were never any studies being undertaken by the QWC in 2010 and 2011 in relation to possible options to increase the yield from the Somerset / Wivenhoe Dams. It may be that some such were carried out after I left the QWC but I have no knowledge of them.

TOPIC 14: MY ROLE IN RELATION TO THE DECISION TO DRAW DOWN WIVENHOE DAM TO 75% OF FULL SUPPLY LEVEL IN FEBRUARY 2011, AND ANY COMMUNICATIONS SENT OR RECEIVED BY ME IN RELATION TO IT (ANY COMMUNICATIONS, INCLUDING EMAILS, SENT OR RECEIVED BY ME ON THIS TOPIC DURING THIS PERIOD ARE ANNEXED TO THIS STATEMENT)

145 I did not have a direct role in relation to the decision to draw down Wivenhoe Dam to 75% of Full Supply Level in February 2011.

146 However, I was involved in assessing the impact of draw downs on water security in the following ways.

147 Memoranda and emails relevant to this topic are annexed to this statement as **Annexure N.**

148 On 18 January 2011, Mr Reilly forwarded to me for information an email by which he advised Mr Borrows that he had approved a variation to the flood release regime prescribed in the Flood Mitigation Manual. The variation was sought in order to maintain the current releases for a further 12 hours. Doing so ensured a constant flow

at the off-take to the Lowood Water Treatment Plant, enabling supply to continue while rectification work was underway. I am uncertain whether this is directly related to the draw down but refer to it for completeness sake. It was, insofar as I was concerned, a 'stand alone' event.

149 My indirect role in the decision commenced when I was copied in to an email from the Minister's office to the Water Grid Manager. The letter requested that the Water Grid Manager assist Seqwater in connection with a request the Minister had made of it (which was whether the drawdown could occur).

150 I subsequently received an email from Mr Dennien on 21 January 2011. Mr Dennien requested that I organise for modelling to be conducted to assess the impact on water security of a drawdown of Wivenhoe Dam to 80 and 90% (respectively). I subsequently arranged for that to occur, principally by emails with Gilbert and Sutherland (the external consultants who carried out the modelling).

151 Mr Dennien and I also exchanged other emails about further modelling on different scenarios. I organised for that modelling to be conducted by Gilbert and Sutherland (by email) and received the relevant modelling back from them.

152 Having received the requisite modelling, on 1 February 2011, I emailed Mr Bradley and Ms Best of DERM to advise that modelling indicated that drawing down Wivenhoe Dam to 75% of its Full Supply Level until the end of the wet season would have negligible water security impacts. I suggested that a staged release strategy be considered.

Signed:.....[redacted]..... Taken by:..[redacted].....

Daniel Thomas Spiller [~~Justice of the Peace~~/Solicitor]

153 At around the same date, I had a telephone conversation with Mr Foster from Seqwater in which I indicated that preliminary modelling confirmed that drawing down Wivenhoe Dam to 75% of its Full Supply Level until the end of the wet season would have negligible water security impacts. I suggested that a staged release strategy be considered.

154 I did also receive some emails, largely as a copied recipient, in connection with that process. The Water Grid Manager was provided with a copy of the Minister's letter to Seqwater in connection with the proposed drawdown. The Minister requested that the Water Grid Manager assist Seqwater. I have received some emails about that.

155 There was also some further modelling done at my request by Gilbert and Sutherland.

156 In addition, to the best of my recollection, I attended one meeting with Mr Dennien where the draw down was discussed. I do not recall the exact words that we used in meeting, or who said them. The only recollection I have of this meeting is that Seqwater presented its initial findings to DERM and said that dropping the dam to 75% would have resulted in a 0.2 to 0.4 metre reduction in the flood height. To the best of my recollection, although I cannot be sure, this meeting occurred on 10 February 2011.

157 At 10:00am on 10 February 2011, I participated in a teleconference regarding the regulatory framework for the implementation of a temporary drawdown. The teleconference was called following the meeting with the Minister that morning. It was chaired by [redacted] and involved officers DERM (including [redacted] and the QW[redacted] My

Signed:[redacted]..... Taken by: [redacted].....

Daniel Thomas Spiller [~~Justice of the Peace~~/Solicitor]

email records show that officers from Seqwater were invited to participate. I have a passing recollection that the representatives were Mr Foster and [redacted]

158 During the teleconference, the officers from DERM stated that the releases could be made from the Water Grid Manager's water entitlement without regulatory amendments. I advised that the Water Grid Manager would not object to the use of some of its entitlement for the purposes of the drawdown and that it would not use its full entitlement during the current water year. However, I noted that the amount that could be made available would be insufficient for a 25% drawdown to be made and maintained, especially in the event of further inflows.

159 Alternative options were discussed at a high level, including amendments to the Manual and Resources Operations Plan. A preferred option was not agreed. DERM was to review options and seek advice. I had no further involvement in this process, prior to being advised of the outcomes by Mr Dennien around 11 February 2011.

160 As context, the Water Grid Manager holds entitlements for 278,725 megalitres from Wivenhoe Dam. About 60,000 megalitres of this entitlement was used over the seven months to end January 2011. At this rate, about 100,000 megalitres of the entitlement will be used over the water year. In comparison, the Full Supply Level of Wivenhoe Dam is 1,165,238 megalitres. A once-off drawdown to 75% of capacity would involve releases of about 291,000 megalitres.

Signed: [redacted]
Daniel Thomas Spiller

Taken ~~by~~: [redacted]
[~~Justice of the Peace~~/Solicitor]

161 It is essential that sufficient entitlement be available in order to be able to increase supply from Wivenhoe Dam in the event of increased demand or other water sources becoming unavailable.

162 On 22 March 2011, Mr Borrows requested advice from the Water Grid Manager about whether it would object to an extension of time to the temporary draw down until 30 June 2011. Mr Dennien replied to that request on 25 March 2011 and clarified that advice on 1 April 2011.

163 I arranged for my staff to undertake water security modelling for that purpose.

TOPIC 15: ANY COSTINGS PRODUCED BY QUEENSLAND TREASURY, THE SOUTH EAST QUEENSLAND WATER GRID MANAGER, QUEENSLAND WATER COMMISSION, SEQWATER OR ANY OTHER BODY IN RELATION TO THE COSTS ASSOCIATED WITH THE TEMPORARY REDUCTION TO 75% OF FULL SUPPLY LEVEL OF WIVENHOE DAM IN FEBRUARY 2011

164 I assume that by 'costings', I am being asked about any monetary costings in relation to the temporary reductions. There could be other, non-monetary, costs of reducing the dams such as a cost in the sense of an increased risk of water restrictions at an earlier time (or at all) because of the reduction in the dam and the like. I have confined my comments below to monetary costings assuming that was the intent.

165 I am not aware of any costings being produced by the Queensland Treasury, the Water Grid Manager, the QWC, Seqwater or any other body specifically in relation to the costs associated with the temporary reduction to 75% of Full Supply Level of Wivenhoe Dam in February 2011. General work on costings associated with impacts on the Water Grid are discussed above in topic 5.

Signed:..[redacted]..... Taken by:..[redacted].....

Daniel Thomas Spiller [Justice of the Peace/Solicitor]

TOPIC 16: AN ACCOUNT OF ANY DISCUSSIONS, VERBATIM WHERE POSSIBLE, FOLLOWING THE JANUARY 2011 FLOOD EVENTS IN RELATION TO A REVIEW OF COMMUNICATIONS BETWEEN THE FLOOD OPERATION CENTRE, OFFICE OF THE WATER SUPPLY REGULATOR, SOUTH EAST QUEENSLAND WATER GRID MANAGER AND OTHERS WHEN THE FLOOD OPERATIONS CENTRE IS MOBILISED

166 To the best of my recollections, there were two meetings following the January 2011 flood events which have discussed the communications protocol and potential improvements to it.

167 I attended both those meetings, together with Mr Denner and [redacted] from the Water Grid Manager.

168 The two meetings occurred on 3 and 25 March 2011. There were memoranda and emails in relation to those meetings and copies of those are annexed to this statement as **Annexure O**. I cannot now recollect the exact words used at those meetings. Based on the discussions at the 3 March meeting, Emergency Management Queensland distributed its amended version of the protocol for comment on 24 March 2011.

169 My understanding of the effect of the discussions at those meetings was that the Communications Protocol that had been in place dealt largely with communications between technical entities and communications with the public. The Communications Protocol is, as I understand it, to be amended to deal with the interface for emergency management. By that I mean that the Communication Protocol needs to address how the emergency management groups, and those involved in the emergency management process, communicate with each other. As I understood it, no conclusions have been reached and there was (particularly at the last meeting)

disagreement about who would be responsible for what parts of the communications plan.

All the facts and circumstances deposed to herein are within my own knowledge, save such as are deposed to from information only, and my means of knowledge and sources of knowledge appear in this my statement to the Commission.

Affirmed by Daniel Thomas Spiller on 17 May 2011 at Brisbane in the presence of:

Signed:.....[redacted]..... Taken by:[redacted].....

Daniel Thomas Spiller [~~Justice of the Peace~~/Solicitor]

Index to annexures to supplementary statement of Daniel Spiller 17 May 2011

Annexure No.	Topic No.	Topic Description	Date
Volume 1			
AA	3	A request by the Hon. Stephen Robertson MP, then Minister for Energy, Mines and Natural Resources made by letter dated 25.10.2010 to South East Queensland Water Grid Manager to investigate the prospects of reducing the levels of Wivenhoe, Somerset and North Pine Dams.	22.01.2010 to 24.12.2010
	4	Any actions by South East Queensland Water Grid Manager in response to number 3.	
Volume 2			
A	5	Any document produced by Queensland Treasury, the south East Queensland Water Grid Manager, Queensland Water Commission, Seqwater or any other body about the cost of potential reductions in the levels of Wivenhoe, Somerset and/or North Pine Dams between 1 October 2010 and 31 March 2011	March 2010 – April 2011
B	6	Role of Daniel Spiller in relation to the creation of draft communications protocol following flooding downstream of the Wivenhoe Dam in October 2010	14.10.2010 to 27.12.2010
C	7	Details of any communications by Daniel Spiller with the Flood Operations Centre between 6 and 19 January 2011, verbatim where possible	15.01.2011
Volume 3			
D	8	Role in relation to the communication of decisions made by Flood Operations Centre to external persons and agencies between 6 and 19 January 2011.	06.01.2011 to 11.01.2011
Volume 4			
D (cont)	8	Role in relation to the communication of decisions made by Flood Operations Centre to external persons and agencies between 6 and 19 January 2011.	11.01.2011 to 17.01.2011
Volume 5			
D (cont)	8	Role in relation to the communication of decisions made by Flood Operations Centre to external persons and agencies between 6 and 19 January 2011.	17.01.2011 to 19.01.2011
Volume 6			
G	11 (a)	Daniel Spiller communications with John Bradley, Director-General, Department of Environment and Resource Management between 01.09.2010 and 31.03.2011.	11.10.2010 to 24.03.2011
H	11(b)	Daniel Spiller communications with the Hon. Stephen Robertson MP, Minister for Energy, Mines and Natural Resources and subsequently Minister for Energy and Water Utilities between 01.09.2010 and 31.03.2011.	October 2010 to March 2011
Volume 7			
I	11 (c)	Daniel Spiller communications with the Hon. Stephen Robertson MP's ministerial advisors between 1 September 2010 and 31 March 2011.	13.09.2010 to 07.03.2011
J	11 (d)	Daniel Spiller communications with Peter Borrows, Chief Executive Officer, Seqwater between 1 September 2010 and 31 March 2011.	04.10.2010 to 26.10.2010

Annexure No.	Topic No.	Topic Description	Date
Volume 8			
J (cont)	11 (d)	Daniel Spiller communications with Peter Borrows, Chief Executive Officer, Seqwater between 1 September 2010 and 31 March 2011.	26.10.2010 to 24.03.2011
K	11 (e)	Daniel Spiller communication with Mary Boydell, Queensland Water Commissioner between 1 September 2010 and 31 March 2011.	23.09.2010 to 27.01.2011
L	11 (f)	Daniel Spiller communication with Karen Waldman, Chief Executive Officer, Queensland Water Commission between 1 September 2010 and 31 March 2011.	23.09.2010 to 31.03.2011
M	12	Discontinuance of study in relation to potentially increasing the Full Supply Level of Wivenhoe Dam undertaken by Queensland Water Commission in 2010 and 2011.	11.10.2010
Volume 9			
M (cont)	12	Discontinuance of study in relation to potentially increasing the Full Supply Level of Wivenhoe Dam undertaken by Queensland Water Commission in 2010 and 2011.	2008 to 2010
Volume 10			
N	14	Daniel Spiller role in relation to decision to draw down Wivenhoe Dam to 75% of Full Supply Level in February 2011, and any communications sent or received by him in relation to it.	18.01.2011 to 01.04.2011
O	16	Account of any discussions, verbatim where possible, following the January 2011 flood events in relation to review of communications between Flood Operations Centre, Office of the Water Supply regulator, South East Queensland Water Grid Manager and others when the Flood Operations Centre is mobilised.	21.01.2011 to 31.03.2011

Lawyers | McCullough Robertson

Documents subject to Cabinet confidentiality

No	Document	Date	Time
1	Email Barry Dennien to John Bradley re actions	19.10.2010	5.20pm
2	Email [redacted] to Dan Spiller re templates for matters to note	20.10.2010	7.59am
3	Email John Bradley to Dan Spiller re Cabinet deliverables	02.10.2010	1.09pm
4	Email Dan Spiller to Barry Dennien re matter to note _desalination and dam levels	20.10.2010	6.50pm
5	Email Dan Spiller to [redacted] re Hi Dan, how is the matter to note coming along	21.10.2010	9.18am
6	Email [redacted] to Dan Spiller re Hi Dan how is the matter to note coming along	21.20.2010	9.37am
7	Email Barry Dennien to Dan Spiller re desal review – cabinet in confidence	21.10.2010	11.35am
8	Email John Bradley to [redacted] and Barry Dennien cc Dan Spiller re desal review – cabinet in confidence	21.10.2010	11.41am
9	Email Dan Spiller to Bob Reilly re matter to note_ desalination and dam levels	21.10.2010	12.25pm
10	Email Bob Reilly to Dan Spiller re matter to note _ desalination and dam levels	21.10.2010	1.31pm
11	Email Dan Spiller to Barry Dennien re matter to note _ desalination and dam levels v2	21.10.2010	1.40pm
12	Email Barry Dennien to Dan Spiller re matter to note _ desalination and dam levels v 2	21.10.2010	2.29pm
13	Email [redacted] to Dan Spiller and Barry Dennien re draft release only	21.10.2010	3.59pm
14	Email [redacted] to Dan Spiller re desal matter to note – cabinet in confidence	21.10.2010	5.48pm
15	Email Dan Spiller to [redacted] re desal matter to note – cabinet in confidence	21.10.2010	6.02pm
16	Email [redacted] to Dan Spiller re desal matter to note – cabinet in confidence	21.10.2010	6.15pm
17	Email [redacted] to Dan Spiller re Hi Dan, when you get in can you please update me re matter to note	22.10.2010	3.44am
18	Email [redacted] to Dan Spiller re Hi Dan, when you get in can you please update me re matter to note	22.10.2010	5.01am
19	Email [redacted] Roberts (Dan Spiller) to John Bradley re matter to note	22.10.2010	5.26am
20	Email Barry Dennien to Dan Spiller re matter to note	22.10.2010	6.25am
21	Email Dan Spiller to John Bradley re matter to note	22.10.2010	7.50am
22	Email John Bradley to Dan Spiller and others re matter to note	22.10.2010	8.06am

No	Document	Date	Time
23	Email Dan Spiller to [redacted]	22.10.2010	8.16am
24	Email [redacted] to Dan Spiller re draft revised release re grid preps for flood	22.10.2010	8.20am
25	Email Dan Spiller to John Bradley and others re matter to note	22.10.2010	8.27am
26	Email Bob Reilly to Dan Spiller re matter to note	22.10.2010	8.36am
27	Email Dan Spiller to Dan Spiller and others re matter to note	22.10.2010	8.41am
28	Email Bob Reilly to Dan Spiller re matter to note	22.10.2010	8.42am
29	Email Dan Spiller to Bob Reilly re matter to note	22.10.2010	8.43am
30	Email Dan Spiller to [redacted] and other	22.10.2010	8.44am
31	Email Dan Spiller to [redacted] re doc2 (7)	22.10.2010	8.57am
32	Email [redacted] to Dan Spiller re and again	22.10.2010	9.07am
33	Email Bob Reilly to Dan Spiller re urgent ministerial brief/letter	22.10.2010	2.11pm
34	Email Dan Spiller to [redacted] re dam level draft release	22.10.2010	3.21pm
35	Email Dan Spiller to Bob Reilly and others re letter	22.10.2010	3.32pm
36	Email Bob Reilly to [redacted] and others cc Dan Spiller and others re Wivenhoe/Somerset protocol	25.10.2010	11.24am
37	Email Dan Spiller to Barton Maher and Mike Foster re draw down of	10.12.2010	4.17pm
38	Letter [redacted] to Andrew Fraser and Stephen Robertson	12.11.2010	

Subject: FW: Information Update - Subject has changed: Meeting to discuss recycled water usage
Location: Level 8, Executive Building, 100 George Street

Start: Thu 22/07/2010 10:45 AM
End: Thu 22/07/2010 11:45 AM

Recurrence: (none)

Organizer: [redacted]/TO/QTreasury

When: Thursday, 22 July 2010 10:45 AM-11:45 AM (GMT+10:00) Brisbane.
Where: Level 8, Executive Building, 100 George Street

~~*~*~*~*~*~*~*~*~*~*

From: [redacted]TO/QTreasury [mailto:[redacted]
Sent: Tuesday, 20 July 2010 11:03 AM
To: Dennien Barry; [redacted]; Ken Sedgwick/TO/QTreasury
Cc: [redacted]
Subject: Information Update - Subject has changed: Meeting to discuss recycled water usage
When: Thursday, 22 July 2010 10:45 AM-11:45 AM (GMT+10:00) Brisbane.
Where: Level 8, Executive Building, 100 George Street

Calendar Entry

Subject

Meeting to discuss recycled water usage

When

Date
22/07/2010

Time
10:45 AM - 11:45 AM (1 hour)

Where

Level 8, Executive Building, 100 George Street

Chair

[redacted]/TO/QTreasury

Invitees

Required (to)

[redacted]

Optional (cc)

[redacted]/TO/QTreasury@QTreasury

My apologies, the subject should read "recycled water usage" not waste.
Thanks

[redacted]

****

Only an individual or entity who is intended to be a recipient of this e-mail may access or use the information contained in this e-mail or any of its attachments. Opinions contained in this e-mail or any of its attachments do not necessarily reflect the opinions of Queensland Treasury.

The contents of this e-mail and any attachments are confidential and may be legally privileged and the subject of copyright. If you have received this e-mail in error, please notify Queensland Treasury immediately and erase all copies of the e-mail and the attachments. Queensland Treasury uses virus scanning software. However, it is not liable for viruses present in this e-mail or in any attachment.

****

<<c105920.ics>> <<pic17965.gif>> <<pic11837.gif>>


c105920.ics


pic17965.gif


pic11837.gif

From: [redacted]
Sent: Tuesday, 27 July 2010 2:32 PM
To: Dennien Barry; Spiller Daniel (SEQWGM)
Cc: [redacted]
Subject: Water Grid operating arrangements
Attachments: 2-TY_TO-700231-Letter_RMs_to_WGM_regarding_SEQ_Water_Strategy_implications_July_2010.doc

Hi Barry and Dan,

Attached below is a draft letter from RMs seeking advice on optimal operating arrangements for the Water Grid. Any feedback/comments would be appreciated - we're hoping to get the letter to RMs for sign-off in the next day or so.

As discussed last week, the letter doesn't specify a timeframe for providing a response, but RMs have indicated they are expecting advice on this issue as soon as possible (bearing in mind the Board will need to consider the response).

Happy to discuss.

Thanks,

[redacted]

Economic and Structural Policy
Queensland Treasury

Tel: [redacted]

(See attached file:
2-TY_TO-700231-Letter_RMs_to_WGM_regarding_SEQ_Water_Strategy_implications_July_2010.doc)

****
Only an individual or entity who is intended to be a recipient of this e-mail may access or use the information contained in this e-mail or any of its attachments. Opinions contained in this e-mail or any of its attachments do not necessarily reflect the opinions of Queensland Treasury.

The contents of this e-mail and any attachments are confidential and may be legally privileged and the subject of copyright. If you have received this e-mail in error, please notify Queensland Treasury immediately and erase all copies of the e-mail and the attachments. Queensland Treasury uses virus scanning software. However, it is not liable for viruses present in this e-mail or in any attachment.

****

RESPONSIBLE MINISTERS FOR

SEQ WATER GRID MANAGER

Our Reference: TRX-13680

Mr [redacted]
Chair
SEQ Water Grid Manager
PO Box 16205
CITY EAST QLD 4002

Dear Mr [redacted]

We are writing in relation to the recent publication of the South East Queensland (SEQ) Water Strategy, which outlines the plan to ensure a sustainable, efficient and secure water supply for the region.

The Strategy highlights that water supply for SEQ is secure for the short to medium-term, due to the construction of the Water Grid and the combined level of SEQ water storages at near full capacity. The Strategy also illustrates the increased security of supply provided by the desalination facility at Tugun and the Western Corridor Recycled Water Scheme (WCRWS), even without the projects being operated at full capacity at all times.

The Strategy reiterates the optimal operating strategy for the SEQ Water Grid consists of using purified recycled water (PRW) to augment drinking water supplies only when combined storages fall to 40 per cent capacity.

Given this situation, the Strategy seeks to maximise the benefits of current water supply security by establishing a framework for the efficient operation of the SEQ Water Grid, so that the need for new supplies is deferred for as long as possible.

In view of the short to medium-term water security outlook for SEQ, we are seeking advice from the Water Grid Manager on the optimal operating arrangements for the Water Grid and, in particular, climate resilient supply projects. Given the optimal operating arrangements for the Grid depend largely on bulk water and PRW demand, advice should be provided on both current and potential demand scenarios. Relevant economic and environmental considerations associated with each operating scenario should also be canvassed.

With reference to the Water Grid Manager's 2010-11 Operational Plan and 2010-15 Strategic Plan, we also request further information on the development of the Water Grid Operating Strategy, cost optimisation modelling, and progress on new PRW customers.

We understand the Water Grid Manager is working closely with the Queensland Water Commission on potential new PRW customers, and with other bulk water entities in relation to Water Grid operating costs.

In this regard, we have also sought advice from WaterSecure on optimal operating arrangements for its climate resilient supply projects. We note that, in considering this issue, WaterSecure will require advice on demand scenarios from the Water Grid Manager.

We understand the Water Grid Manager and WaterSecure will be working closely together in responding to our information request.

We look forward to your earliest advice on these matters.

Yours sincerely

ANDREW FRASER

STEPHEN ROBERTSON

The Hon. Andrew Fraser MP, Treasurer and
Minister for Employment and Economic Development

Level 9 Executive Building
100 George Street, Brisbane

GPO Box 611, Brisbane
Queensland 4001 Australia

Telephone +617 3224 6900
Facsimile +617 3229 0642

The Hon. Stephen Robertson MP, Minister for Natural Resources, Mines and Energy and Minister for Trade

Level 17 QMEC Building
61 Mary Street, Brisbane

PO Box 15216, City East
Queensland 4002 Australia

Telephone +617 3225 1861
Facsimile +617 3225 1828

From: Spiller Daniel (SEQWGM) [IMCEAEX-_O=DEPT+20OF+20NATURAL+20RESOURCES_OU=QUEENSLAND_CN=RECIPIENTS_CN=SPILLER+5FD[redacted]

Sent: Tuesday, 27 July 2010 5:06 PM

To: [redacted] Dennien Barry

Cc: [redacted]

Subject: RE: Water Grid operating arrangements

Attachments: 2-TY_TO-700231-Letter_RMs_to_WGM_regarding_SEQ_Water_Strategy_implications_July_2010_DS.doc

[redacted]

Our comments attached. Thanks for the opportunity.

As discussed, I have separated operating strategy (ie do we keep the desalination plant operating?) from the implementation of that strategy (ie what are the costs involved in demobilising and mobilising, what does it mean for contracts with operators, how many trains would we continue to operate, what does it mean for our training and development, can we reduce corporate overheads as a result, etc?) This reflects our respective roles (and economic oversight). In practice, we will develop the preferred approach jointly.

Please call if I can be of any help.

Dan

-----Original Message-----
From: [redacted]
Sent: Tuesday, 27 July 2010 2:32 PM
To: Dennien Barry; Spiller Daniel (SEQWGM)
Cc: [redacted]
Subject: Water Grid operating arrangements

Hi Barry and Dan,

Attached below is a draft letter from RMs seeking advice on optimal operating arrangements for the Water Grid. Any feedback/comments would be appreciated - we're hoping to get the letter to RMs for sign-off in the next day or so.

As discussed last week, the letter doesn't specify a timeframe for providing a response, but RMs have indicated they are expecting advice on this issue as soon as possible (bearing in mind the Board will need to consider the response).

Happy to discuss.

Thanks,

[redacted]

Economic and Structural Policy
Queensland Treasury

Tel: [redacted]

(See attached file:
2-TY_TO-700231-Letter_RMs_to_WGM_regarding_SEQ_Water_Strategy_implications_July_2010.doc)
****
****

Only an individual or entity who is intended to be a recipient of this e-mail may access or use the information contained in this e-mail or any of its attachments. Opinions contained in this e-mail or any of its attachments do not necessarily reflect the opinions of Queensland Treasury.

The contents of this e-mail and any attachments are confidential and may be legally privileged and the subject of copyright. If you have received this e-mail in error, please notify Queensland Treasury immediately and erase all copies of the e-mail and the attachments. Queensland Treasury uses virus scanning software. However, it is not liable for viruses present in this e-mail or in any attachment.

****
****

RESPONSIBLE MINISTERS FOR

SEQ WATER GRID MANAGER

Our Reference: TRX-13680

Mr [redacted]
Chair
SEQ Water Grid Manager
PO Box 16205
CITY EAST QLD 4002

Dear Mr [redacted]

We are writing in relation to the recent publication of the South East Queensland (SEQ) Water Strategy, which outlines the plan to ensure a sustainable, efficient and secure water supply for the region.

The Strategy highlights that water supply for SEQ is secure for the short to medium-term, due to the construction of the Water Grid and the combined level of SEQ water storages at near full capacity. The Strategy also illustrates the increased security of supply provided by the desalination facility at Tugun and the Western Corridor Recycled Water Scheme (WCRWS), even without the projects being operated at full capacity at all times.

The Strategy reiterates the optimal operating strategy for the SEQ Water Grid consists of using purified recycled water (PRW) to augment drinking water supplies only when combined storages fall to 40 per cent capacity.

Given this situation, the Strategy seeks to maximise the benefits of current water supply security by establishing a framework for the efficient operation of the SEQ Water Grid, so that the need for new supplies is deferred for as long as possible.

In view of the short to medium-term water security outlook for SEQ, we are seeking advice from the SEQ Water Grid Manager on current and potential demand scenarios. We especially seek your advice regarding demand for purified recycled water.

We also seek your advice regarding the optimal operating ~~arrangements~~ strategy for the SEQ Water Grid to meet these demands and the security objectives detailed in the SEQ Water Strategy and the System Operating Plan. ~~and, i~~In particular, we seek your advice about the optimal operating strategy for climate resilient supply projects. ~~Given the optimal operating arrangements for the Grid depend largely on bulk water and PRW demand, advice should be provided on both current and potential demand scenarios.~~ Relevant strategic economic and environmental considerations associated with each operating scenario should also be canvassed.

With reference to the Water Grid Manager's 2010-11 Operational Plan and 2010-15 Strategic Plan, we also request further information on the development of the Water Grid Operating Strategy, cost optimisation modelling, and progress on new PRW customers.

We understand the Water Grid Manager is working closely with the Queensland Water Commission on potential new PRW customers, and with other bulk water entities in relation to Water Grid operating costs.

In this regard, we have also sought advice from WaterSecure on the implementation of the optimal operating ~~arrangements~~ strategy for its climate resilient supply projects. We note that, in considering this issue, WaterSecure will require advice on demand scenarios and operating strategy from the Water Grid Manager.

We understand the Water Grid Manager and WaterSecure will be working closely together in responding to our information request.

We look forward to your earliest advice on these matters.

Yours sincerely

ANDREW FRASER

STEPHEN ROBERTSON

The Hon. Andrew Fraser MP, Treasurer and
Minister for Employment and Economic Development

Level 9 Executive Building
100 George Street, Brisbane

GPO Box 611, Brisbane
Queensland 4001 Australia

Telephone +617 3224 6900
Facsimile +617 3229 0642

The Hon. Stephen Robertson MP, Minister for Natural Resources, Mines and Energy and Minister for Trade

Level 17 QMEC Building
61 Mary Street, Brisbane

PO Box 15216, City East
Queensland 4002 Australia

Telephone +617 3225 1861
Facsimile +617 3225 1828

RECEIVED
15 SEP 2010
Water Grid Manager

Queensland Government

RESPONSIBLE MINISTERS FOR

SEQ WATER GRID MANAGER

TRX-13680

13 SEP 2010

Mr [redacted]
Chair
SEQ Water Grid Manager
PO Box 16205
CITY EAST QLD 4002

Dear Mr [redacted]

We are writing in relation to the recent publication of the South East Queensland (SEQ) Water Strategy, which outlines the plan to ensure a sustainable, efficient and secure water supply for the region.

The Strategy highlights that water supply for SEQ is secure for the short to medium-term, due to the construction of the Water Grid and the combined level of SEQ water storages at near full capacity. The Strategy also illustrates the increased security of supply provided by the desalination facility at Tugun and the Western Corridor Recycled Water Project (WCRWP), even without the projects being operated at full capacity at all times.

The Strategy reiterates the optimal operating strategy for the SEQ Water Grid consists of using purified recycled water (PRW) to augment drinking water supplies only when combined storages fall to 40 per cent capacity.

Given this situation, the Strategy seeks to maximise the benefits of current water supply security by establishing a framework for the efficient operation of the SEQ Water Grid, so that the need for new supplies is deferred for as long as possible.

In view of the short to medium-term water security outlook for SEQ, we are seeking advice from the SEQ Water Grid Manager on current and potential demand scenarios for the Water Grid and, in particular, demand for purified recycled water.

We also seek your advice regarding the optimal operating strategy for the SEQ Water Grid and, in particular, climate resilient supply projects, to meet these demands and the security objectives detailed in the SEQ Water Strategy and the System Operating Plan. Relevant strategic economic and environmental considerations associated with each operating scenario should also be canvassed.

With reference to the Water Grid Manager's 2010-11 Operational Plan and 2010-15 Strategic Plan, we also request further information on the development of the Water Grid Operating Strategy, cost optimisation modelling, and progress on new PRW customers.

We understand the Water Grid Manager is working closely with the Queensland Water Commission on potential new PRW customers, and with other bulk water entities in relation to Water Grid operating costs.

In this regard, we have also sought advice from WaterSecure on issues for its climate resilient supply projects associated with the implementation of the optimal operating strategy. We note that, in considering this issue, WaterSecure will require advice on demand scenarios and the Water Grid Operating Strategy from the Water Grid Manager.

We understand the Water Grid Manager and WaterSecure will be working closely together in responding to our information request.

We look forward to your earliest advice on these matters.

Yours sincerely

[redacted]

ANDREW FRASER

STEPHEN ROBERTSON

The Hon. Andrew Fraser MP, Treasurer and
Minister for Employment and Economic Development

Level 9 Executive Building
100 George Street, Brisbane

GPO Box 611, Brisbane
Queensland 4001 Australia

Telephone [redacted]
Facsimile +617 3229 0642

The Hon. Stephen Robertson MP, Minister for Natural Resources,
Mines and Energy and Minister for Trade

Level 17 QMEC Building
61 Mary Street, Brisbane

PO Box 15216, City East
Queensland 4002 Australia

Facsimile +617 3225 1828

From: Barry Dennien [redacted]
Sent: Thursday, 23 September 2010 8:28 AM
To: Dan Spiller
Subject: Fwd: Correspondence from Minister Robertson
Attachments: Minister Robertson to Commissioner Boydell - Water Security.PDF; ATT00001..htm

Regards
Barry Dennien

Begin forwarded message:

From: [redacted]
Date: 23 September 2010 8:11:48 AM AEST
To: Barry Dennien [redacted]
Subject: Correspondence from Minister Robertson

Hi [redacted]

Sorry for the delay, letter as requested.

Kind regards.

[redacted]
A/Executive Assistant to the Chief Executive Officer - Karen Waldman
and the Commissioner - Mary Boydell
Queensland Water Commission
Level 16, 53 Albert Street, Brisbane QLD 4000
PO Box 15087, City East QLD 4002
☎ (07) [redacted] 🖷 (07) [redacted]
✉ [redacted]@qwc.qld.gov.au

From: Barry Dennien [mailto:[redacted]
Sent: Wednesday, 22 September 2010 1:16 PM
To: [redacted]
Subject:

[redacted]

As discussed

Barry Dennien

Chief Executive Officer

SEQ Water Grid Manager

Phone: [redacted]

Email: [redacted]
Visit: Level 15, 53 Albert Street, Brisbane

Post: PO Box 16205, City East Qld 4002

ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

****
The information in this email together with any attachments is intended only for the person or entity to which it is addressed and may contain confidential and/or privileged material.

Any form of review, disclosure, modification, distribution and/or publication of this email message is prohibited, unless as a necessary part of Departmental business.

If you have received this message in error, you are asked to inform the sender as quickly as possible and delete this message and any copies of this message from your computer and/or your computer system network.
****

RECEIVED

09 SEP 2010

Hon Stephen Robertson MP
Member for Stretton

Queensland Government

Minister for Natural Resources, Mines and Energy and Minister for Trade

Ref CTS 13479/10

01 SEP 2010

Ms Mary Boydell
Commissioner
Queensland Water Commission
PO Box 15087
CITY EAST QLD 4002

Dear Ms Boydell

The Queensland Water Commission's (QWC) South East Queensland (SEQ) Water Strategy reiterates that the optimal operating strategy for the SEQ Water Grid consists of using purified recycled water (PRW) to augment drinking water supplies only when combined storages fall to 40 % capacity.

In view of the short to medium-term water security outlook for SEQ, I am seeking your advice on the optimal operating arrangements for the Water Grid.

Advice is also being sought by Responsible Ministers from WaterSecure and the SEQ Water Grid Manager on optimal operating arrangements for the Gold Coast Desalination Project, the Western Corridor Recycled Water Project, and the SEQ Water Grid, as well as current and expected demand scenarios for the Water Grid, particularly in relation to PRW.

I understand that the Water Grid Manager and WaterSecure will be working closely together in responding to the request and I encourage QWC to liaise directly with representatives of these entities.

Should you have any further enquiries, please do not hesitate to contact Mr [redacted] Manager, Strategic Water Entities Governance of the Department of Environment and Resource Management on telephone [redacted].

Yours sincerely

[redacted]

STEPHEN ROBERTSON MP

Level 17
61 Mary Street Brisbane Qld 4000
PO Box 15216 City East
Queensland 4002 Australia
Telephone +61 7 3225 1861
Facsimile +61 7 3225 1828
Email nrmet@ministerial.qld.gov.au

MEDIA MONITORS



Gold Coast Bulletin
12-Oct-2010
Page: 1
General News
Market: Gold Coast QLD
Circulation: 39593
Type: Regional
Size: 1084.76 sq.cms
Frequency: MTWTF--

The great drain robbery

You pay $32,000 a day for desalinated water as dams overflow

BIG WET
4 PAGES OF PICTURES AND REPORTS

[redacted] overflowing but the Tugun desalination plant is still costing taxpayers $32,000 a day as it continues to pump out unwanted water.

The State Government is refusing to [redacted] The decision not to shut down the $1 billion plant has angered Gold Coast Ratepayers Association president Scott Allen who said it was common sense to turn it off until it was needed.

[redacted] SEQ Water spokesman Dan Spiller said it was more practical and efficient to run the plant at its lowest capacity which costs about $731 for each of the 44 megalitres it produces daily.

P4

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

Gold Coast Bulletin
12-Oct-2010
Page: 1
General News
Market: Gold Coast QLD
Circulation: 39593
Type: Regional
Size: 1084.76 sq.cms
Frequency: MTWTF--

Desal pumping up cost

HENRY TUTTIETT
tuttietth@goldcoast.com.au

THE dams are overflowing and roads are flooding but taxpayers will still be slugged $32,000 a day for the troubled Tugun desalination plant to churn out 44 million litres of water they do not need.

Operators have refused to mothball the expensive plant and are continuing to run it at 33 per cent capacity despite the Hinze Dam filling up overnight and every other dam in the southeast at 100 per cent.

The water is being supplied to the already full dams in the SEQ Water grid at the water authority's direction.

SEQ Water spokesman Dan Spiller yesterday said it was more practical and efficient to run the plant at its lowest capacity which costs about $731 for each of the 44 megalitres it produces daily.

In July, operations manager Scott Murphy revealed the plant could easily be turned off for long periods and started up whenever needed.

"It requires regular maintenance, but it could be up and running again within weeks, depending on how long it was mothballed for," he said at the time.

Calls for the plant to be temporarily switched off grew yesterday as southeast Queensland dams reached capacity with 1000 megalitres of water spewed over the Wivenhoe Dam wall every hour.

Gold Coast Ratepayers Association president Scott Allen said it was logical to stop production and maintain the plant until it was needed.

"It is common sense that the thing shouldn't be running now," he said.

"I believe the southeast water grid and its operations reflect a poor state of management at all levels of administration.

"It is a very costly exercise, as we are seeing, and with the projections of a 200 per cent rise over the next 10 years in water pricing, ratepayers and taxpayers are paying for ongoing political folly."

Mermaid Beach MP Ray Stevens said even if the plant was turned off, Gold Coasters would still lose out.

"Catchment water is obviously a lot cheaper than desalinated water and unfortunately the residents of the Gold Coast are victims of the Bligh Labor Government and its high-price changes for bulk water supply," he said.

But Mr Spiller said even in wet weather it was important the plant continued to operate.

"It is more practical and efficient to run the plant at its lowest reliable design capacity, thereby minimising cost of production," he said.

"Although water storages are currently plentiful, there will inevitably be another drought."

Mayor Ron Clarke, who has previously raised the idea of mothballing the plant, said Gold Coast residents were paying $2.68 per kilolitre of water.

Natural Resources Minister Stephen Robertson said 24,000 megalitres of water spilled over the Wivenhoe Dam wall yesterday and would continue to spill the same amount in coming days.

Dam levels

Wivenhoe	100%
Somerset	100%
Hinze	100%
Little Nerang	100%
Leslie Harrison	100%
North Pine	100%

Copyright Agency Ltd (CAL) licenced copy.

[redacted]

Subject:	Meeting with John Bradley and Barry Denein from the Water Grid Manager re options for the Desal and Western Corridor and water pricing CBRC sub
Start:	Tue 19/10/2010 3:30 PM
End:	Tue 19/10/2010 4:00 PM
Recurrence:	(none)
Meeting Status:	Accepted
Organizer:	Stephen Robertson
Categories:	Important

Attending: [redacted], [redacted], John Bradley, Barry Denein,

Minister's Boardroom

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and /or publication of this email is also prohibited.

Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.

Please consider the environment before printing this email.

From: Dan Spiller <[redacted]
Sent: Wednesday, October 20, 2010 12:35 PM
To: Bradley John <[redacted]
Subject: Cabinet deliverables

John,

Further to our conversation:

- I will draft a Matter to Note for lodgement by 10am Friday. I will consult with Treasury about it (they have major concerns about avoiding any risk of asset impairment). **I will get a draft to you tomorrow.** (Timing will depend upon input from WaterSecure, due tomorrow.)
- I will draft a letter to Seqwater. **Are you happy for me to consult Seqwater in advance to ensure that the letter covers what they would want to look at?** For example, I think they asked to drop the level in Leslie Harrison Dam last year. **Alternatively, or as well, could I speak to John Ruffini and Bob Reilly?**
- **Do you want us to draft an indicative media release for next week?** If so, are you happy for [redacted] to involved, or should we limit it to Barry and I?

Thanks,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
Phone: (07) [redacted] | Fax: (07) [redacted] | Mobile: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: [redacted]
Sent: Thursday, 21 October 2010 8:12 AM
To: Dan Spiller
Subject: Hi Dan, How is the Matter to Note coming along?

Categories: Green Category

[redacted]
Manager and CLLO
Cabinet and Parliamentary Services
Department of Environment and Resource Management
Level 3, 400 George Street Qld
Ph: [redacted]
Mob: [redacted]
Email: [redacted]

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

[redacted]

From: Dan Spiller
Sent: Thursday, 21 October 2010 8:44 AM
To: Jim Pruss
Subject: RE: This morning
Attachments: image001.png; image002.jpg

Categories: Green Category

You didn't mishear. WaterSecure is the other half of what is in play. See you soon.

From: Jim Pruss [redacted]
Sent: Thursday, 21 October 2010 8:43 AM
To: Dan Spiller
Subject: Re: This morning

Sorry dan
Must have misheard you last night. Did socialise the concept with the ceo and rob drury. (All prefaced as confidential) general agreement we can do and it will help us operationally as well as public impacts.

See you at 10

From: Dan Spiller <[redacted]
To: Jim Pruss
Sent: Thu Oct 21 08:39:30 2010
Subject: RE: This morning

10am it is – I've moved the WaterSecure boys.

Dan

From: Jim Pruss [redacted]
Sent: Thursday, 21 October 2010 8:33 AM
To: Dan Spiller
Subject: Re: This morning

Sorry dan
I thought you said you had the morning relatively free. In fact I moved morning meetings to come and see you to get it sorted.
Afternoon terrible and I have a private appointment 7 pm.

Will call you later to discuss times

Jim

From: Dan Spiller <[redacted]
To: Jim Pruss
Sent: Thu Oct 21 08:28:39 2010
Subject: RE: This morning

Jim,

Unfortunately I am catching up with the WaterSecure boys then. Would anytime this afternoon suit? I can work around you.

Dan

From: Jim Prus[redacted]
Sent: Thursday, 21 October 2010 7:47 AM
To: Dan Spiller
Subject: This morning

Dan

Rob Drury and I can drop in around 10 AM if thats OK. We are up at Mineral House on the flood release protocols until then so we will drop in on the way back

Regards

Jim Pruss
Executive General Manager, Water Delivery
QLD Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

h (0[redacted] | Fax (07)[redacted] | M[redacted] | E[redacted]
Level 4 240 Margaret Street, Brisbane City QLD 4000 Australia
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au



Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

his email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution

and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: [redacted]
Sent: Thursday, 21 October 2010 10:02 AM
To: Dan Spiller
Subject: Jim Pruss is here for 10am meeting

Categories: Green Category

[redacted]

From: Dan Spiller
Sent: Friday, 22 October 2010 8:22 AM
To: [redacted]
Subject: Seqwater letter
Attachments: Seqwater letter.docx

Categories: T3

Some of this may be useful also.

Mr Peter Borrows

CEO

...

Dear Peter,

I write to seek your advice about options to and benefits of releasing water from key storages in anticipation of major inflows over the coming summer.

The Grid 12 are at 100 per cent of storage capacity going into the traditional wet season, with forecasts of higher than median rainfall and the prospect of multiple flood events.

At the same time, our water supply is more secure than ever before, due to storages being full, key Water Grid projects completed and ongoing water efficiency.

With this water security, there is an opportunity to reducing the volume stored in key dams as a means of reducing the severity, frequency and duration of flooding in downstream areas.

We have analysed water security for South East Queensland over five years, taking into account differing levels of flows and demand. Our analysis indicates that lowering the combined storage level of Grid 12 storages to 95 per cent of capacity presents a low risk of adversely effecting regional or sub-regional water security. Over the next five years, it would increase the probability of the Grid 12 falling to 40 per cent of combined capacity by only _ per cent, from _ per cent to _ per cent.

We are willing to accept this increased risk, should you consider that pre-emptively reducing storage levels will deliver material benefits in terms of reducing frequency and duration of flooding in downstream areas. We note that, at least in the case of Leslie Harrison Dam, this would represent a return to standard operating practice prior to the drought. We also note the inconvenience and isolation that the recent releases from Wivenhoe Dam caused for residents

To that end, we request ...

Note that individual storages may be reduced to below 95 per cent of storage capacity, depending upon

We also note that, while the released water remains in the watercourse, the rights to it remain vested in the State and the water do not need to be accounted for against our water entitlement. However, we are cognisant that by releasing the water you will potentially affect our ability to take our full water entitlement in the future.

Yours sincerely

Barry Dennien

Chief Executive Officer

In some cases, this is an opportunity to

[redacted]

From: [redacted]
Sent: Friday, 22 October 2010 8:46 AM
To: Dan Spiller
Subject: Re:

Categories: T3

Thx Dan

----- Original Message -
From: Dan Spiller <[redacted]>
To: [redacted]
Cc: Reilly Bob
Sent: Fri Oct 22 08:44:07 2010
Subject:

Tim: Final version.

[redacted] For processing. Tim has reviewed.

Thanks,

Dan

Daniel Spiller

Director, Operations

SEQ Water Grid Manager

Phone: (07) [redacted]

Ema[redacted]

Visit: Level 15, 53 Albert Street Brisbane

Post: PO Box 16205, City East QLD 4002

ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in

error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

+----------+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+----------+

[redacted]

From: [redacted]
Sent: Friday, 22 October 2010 3:34 PM
To: Dan Spiller
Subject: RE: Letter

Categories: T3

thanks Dan

From: Dan Spiller [redacted]
Sent: Friday, 22 October 2010 3:32 PM
To: Hogan Stephenie
Cc: Reilly Bob; Bradley John; [redacted] Dennien Barry @ SEQWGM
Subject: Letter

[redacted]

Draft letter attached.

We have also drafted what a media release would look like, should there be any interest in an announcement (I understand M[redacted] may have spoken to G[redacted] about it).

Apologies for the delay.

Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this

message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

[redacted]

From: Reilly Bob [redacted]
Sent: Sunday, 24 October 2010 5:47 AM
To: Barry Dennien; Dan Spiller
Subject: Fw: Proposed temporary reduction in full supply level of Wivenhoe dam

Categories: T3

----- Original Message -----
From: [redacted]
To: Reilly Bob
Sent: Sun Oct 24 05:38:57 2010
Subject: Proposed temporary reduction in full supply level of Wivenhoe dam

Hi Barry, Dan

You may have already thought of this, in which I case I apologise for raising it.

If we temporarily drop the full supply level e.g to 95%, for the next few months, then Toowoomba will argue that they should be able to access that water for nothing if they want it.

Separately, and perhaps more importantly, their position on this matter may also influence how fast we can drop the level to 95% i.e depending upon the release strategy, we could get it to 95% a lot faster than if we were solely relying on Toowoomba to drop the level by pumping it up to Cressbrook.

Regards

Bob

+----------+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+----------+

[redacted]

From: Reilly Bob [redacted]
Sent: Sunday, 24 October 2010 10:46 AM
To: [redacted]
Cc: Barry Dennien; Dan Spiller
Subject: Fw: Possibile modification to Wivenhoe/Somerset flood protocol to cover the proposed low-level releases to keep Somerset/Wivenhoe dam levels at 95% over the next few months

Categories: T3

----- Original Message -----
From: [redacted]
To: Reilly Bob
Sent: Sun Oct 24 10:25:30 2010
Subject: Possibile modification to Wivenhoe/Somerset flood protocol to cover the proposed low-level releases to keep Somerset/Wivenhoe dam levels at 95% over the next few months

Hi [redacted]

Currently the protocol only covers those releases need to get the stroage levels down to 100% of full supply capacity. (Releases below this level are not covered by the Flood Mitigation manual).

So, should the protocol also cover the proposed reductions down to 95% (or whatever level is finally chosen)?

Personally, I think it should, as they are flood mitigation-related releases, but either way I will need a decision on this matter on Monday as it looks as if we will be negotiating with councils on Monday on the protocol.

Thanks

Bob

+----------+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+----------+

[redacted]

From: [redacted]
Sent: Sunday, 24 October 2010 8:58 PM
To: Reilly Bob
Cc: Barry Dennien; Dan Spiller
Subject: Re: Possibile modification to Wivenhoe/Somerset flood protocol to cover the proposed low-level releases to keep Somerset/Wivenhoe dam levels at 95% over the next few months

Categories: T3

Bob
I understand these releases will affect low level crossings in Somerset and Ipswich local govt areas and so to be consistent with the spirit of the protocol I suggest they be included Chris

----- Original Message -----
From: Reilly Bob
To: [redacted]
Cc: [redacted] @ SEQWGM; [redacted]
Sent: Sun Oct 24 10:45:40 2010
Subject: Fw: Possibile modification to Wivenhoe/Somerset flood protocol to cover the proposed low-level releases to keep Somerset/Wivenhoe dam levels at 95% over the next few months

----- Original Message -----
From: [redacted] <[redacted]
To: Reilly Bob
Sent: Sun Oct 24 10:25:30 2010
Subject: Possibile modification to Wivenhoe/Somerset flood protocol to cover the proposed low-level releases to keep Somerset/Wivenhoe dam levels at 95% over the next few months

Hi [redacted]

Currently the protocol only covers those releases need to get the stroage levels down to 100% of full supply capacity. (Releases below this level are not covered by the Flood Mitigation manual).

So, should the protocol also cover the proposed reductions down to 95% (or whatever level is finally chosen)?

Personally, I think it should, as they are flood mitigation-related releases, but either way I will need a decision on this matter on Monday as it looks as if we will be negotiating with councils on Monday on the protocol.

Thanks

Bob

+----------+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+----------+

Queensland Government

Ref CTS 19311/10

25 OCT 2010

RECEIVED
28 OCT 2010

Office of the
Minister for Natural Resources, Mines and Energy and Minister for Trade

Mr [redacted]
Chair
SEQ Water Grid Manager
PO Box 16205
CITY EAST QLD 4002

Dear [redacted]

I write in relation to seeking advice regarding options to and benefits of releasing water from key storages in anticipation of major inflows over the coming summer.

I understand that the key Water Grid storages are at 100 per cent of storage capacity going into the traditional wet season, with forecasts of higher than median rainfall and the prospect of multiple flood events.

I am also advised that our water supply is more secure than ever before, due to storages being full, key Water Grid projects completed and ongoing water efficiency.

I seek your urgent advice about whether this water security provides an opportunity to reduce the volume stored in key dams as a means of reducing the severity, frequency and duration of flooding in downstream areas.

In doing so, I note that recent releases from Wivenhoe Dam have resulted in significant inconvenience and isolation for residents in some downstream areas. With the catchments saturated, I understand that even quite minor rainfall events will result in further water releases and further inconvenience for these residents.

By end November 2010, I would appreciate your advice as to the available options and the likely benefits. At a minimum, you should review the operation of Wivenhoe, North Pine and Leslie Harrison dams. At least for Leslie Harrison Dam, this would be a return to standard operating procedures prior to the drought, when the dam was routinely drawn down to 95 per cent of capacity to minimise the impacts of storms on downstream residents.

I also seek your confirmation that these options would not significantly impact upon our current water security, measured as the probability of needing to reintroduce Medium Level Restrictions over the next five to ten years.

Level 17
61 Mary Street Brisbane 4000
PO Box 15216 City East
Queensland 4002 Australia
Telephone [redacted]
Facsimile
Email [redacted]@ministerial.qld.gov.au
ABN 65 959 415 158

Queensland Government

Office of the
Minister for Natural Resources, Mines and Energy and Minister for Trade

I emphasise that this is only a temporary measure, reflecting that dams are full prior to the commencement of the traditional wet season. I expect that your advice will include a clear date or trigger beyond which dams will be allowed to fill to their full supply level.

Thank you in advance for your assistance.

Should you have any further enquiries, please feel welcome to contact Mr John Bradley, Director General, Department of Environment and Resource Management on [redacted]

Yours sincerely

[redacted]

STEPHEN ROBERTSON MP

Level 17
61 Mary Street Brisbane 4000
PO Box 15216 City East
Queensland 4002 Australia
Telephone +61 7 3225 1861
Facsimile +61 7 3225 1828
Email nrmet@ministerial.qld.gov.au
ABN 65 959 415 158

[redacted]

From: Dan Spiller
Sent: Monday, 25 October 2010 5:53 PM
To: [redacted]
Cc: Barry Dennien
Subject: Operating level review

Categories: T3

Jim,

I rang but did not catch you. Further to our discussion last week, we have been advised that the Minister has written to us seeking a review of operating levels. We expect to get the letter soon.

I understand that the letter:

- seeks, by end November 2010, advice as to the available options and the likely benefits
- states that, at a minimum, a review of the operation of Wivenhoe, North Pine and Leslie Harrison dams emphasises that this is only a temporary measure, reflecting that dams are full prior to the commencement of the traditional wet season
- seeks advice about a clear date or trigger beyond which dams will be allowed to fill to their full supply level.

I will get a letter from CEO to CEO drafted as soon as possible. In the meantime, given the timeframe, it would be useful if Rob could commence a technical review.

I understand that the protocol with the Councils may also flag the option. Also, the Minister may make a statement. In either case, there is a risk that we may be called on for definitive advice sooner rather than later.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
Phone [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: Dan Spiller
Sent: Monday, 25 October 2010 6:04 PM
To: Barry Dennien
Subject: QWC dam levels heads up

Categories: T3

Barry,

Got a call from [redacted]. He was asked to update their dam level brief to cover off on the reductions. This was the first the QWC knew. I suspect you may get a call (I am sure that [redacted] will have questions about the proposal).

Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: Jim Pruss [redacted]
Sent: Monday, 25 October 2010 8.10 PM
To: Dan Spiller
Subject: Re: Operating level review

Categories: T3

Dan
Did try and call and left a message on your machine.

We have already started review given the conversation last week. Hopefully minister gives us a week or two to digest and advise. If it rains we will have trouble meeting deadlines.

See you tomorrow

From: Dan Spiller [redacted]
To: Jim Pruss
Cc: Barry Dennien <[redacted]
Sent: Mon Oct 25 17:52:32 2010
Subject: Operating level review

Jim,

I rang but did not catch you. Further to our discussion last week, we have been advised that the Minister has written to us seeking a review of operating levels. We expect to get the letter soon.

I understand that the letter:

- seeks, by end November 2010, advice as to the available options and the likely benefits
- states that, at a minimum, a review of the operation of Wivenhoe, North Pine and Leslie Harrison dams emphasises that this is only a temporary measure, reflecting that dams are full prior to the commencement of the traditional wet season
- seeks advice about a clear date or trigger beyond which dams will be allowed to fill to their full supply level.

I will get a letter from CEO to CEO drafted as soon as possible. In the meantime, given the timeframe, it would be useful if Rob could commence a technical review.

I understand that the protocol with the Councils may also flag the option. Also, the Minister may make a statement. In either case, there is a risk that we may be called on for definitive advice sooner rather than later.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.

While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

----------Safe Stamp----------

Your Anti-virus Service scanned this email. It is safe from known viruses.

For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

From: Barry Dennien
Sent: Tuesday, 26 October 2010 7:37 AM
To: Waldman Karen
Cc: [redacted] Dan Spiller
Subject: Request for a review of dam operting levels

Karen

The Minister has asked if we can review the flood safety benefits of pre-emptively dropping Wivenhoe supply levels a few percentage points. I letter will arrive today asking:

- seeks, by end November 2010, advice as to the available options and the likely benefits
- states that, at a minimum, a review of the operation of Wivenhoe, North Pine and Leslie Harrison dams
  emphasises that this is only a temporary measure, reflecting that dams are full prior to the commencement of the traditional wet season
- seeks advice about a clear date or trigger beyond which dams will be allowed to fill to their full supply level.
- Seels advice on the best method, slow release or fast release over a few days as rain events are confirmed

I will cc the letter when it comes in.

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

SEQ Water Grid manager

Secure and efficient water through partnership and innovation

TRIM ref: D/10/7049

2 November 2010

Mr Peter Borrows
Chief Executive Officer
Seqwater
PO Box 16146
City East QLD 4002

Dear Peter

I write to seek your advice about options to, and benefits of, releasing water from key storages in anticipation of major inflows over the coming summer.

The Minister has sought our urgent advice about whether current water security provides an opportunity to reduce the volume stored in key dams as a means of reducing the severity, frequency and duration of flooding in downstream areas. I have attached a copy of his request for your information. You will note that he has highlighted that this is a temporary measure only.

To meet this deadline, I would appreciate your advice about options by 19 November 2010. We can then undertake an assessment of the impact of these options on water security, before jointly preparing advice to the Minister with you.

I understand that Mr Daniel Spiller, Director Operations, has already advised your officers of this request and that investigations have commenced. However, please advise if you have concerns about your ability to meet the above timeframes.

Please do not hesitate to call Dan or [redacted] if you have any queries or require any further information.

Yours sincerely

[redacted]

Barry Dennien
Chief Executive Officer

Enclosed: Letter from Stephen Robertson MP regarding release of water from key storages

PO Box 16205, City East QLD 4002 Tel: +61 7 3247 3012 Fax +61 7 3405 0373 www.seqwgm.qld.gov.au

COPY

Queensland Government

Ref CTS 19311/10

25 OCT 2010

Office of the
Minister for Natural Resources, Mines and Energy and Minister for Trade

Mr [redacted]
Chair
SEQ Water Grid Manager
PO Box 16205
CITY EAST QLD 4002

Dear Mr [redacted]

I write in relation to seeking advice regarding options to and benefits of releasing water from key storages in anticipation of major inflows over the coming summer.

I understand that the key Water Grid storages are at 100 per cent of storage capacity going into the traditional wet season, with forecasts of higher than median rainfall and the prospect of multiple flood events.

I am also advised that our water supply is more secure than ever before, due to storages being full, key Water Grid projects completed and ongoing water efficiency.

I seek your urgent advice about whether this water security provides an opportunity to reduce the volume stored in key dams as a means of reducing the severity, frequency and duration of flooding in downstream areas.

In doing so, I note that recent releases from Wivenhoe Dam have resulted in significant inconvenience and isolation for residents in some downstream areas. With the catchments saturated, I understand that even quite minor rainfall events will result in further water releases and further inconvenience for these residents.

By end November 2010, I would appreciate your advice as to the available options and the likely benefits. At a minimum, you should review the operation of Wivenhoe, North Pine and Leslie Harrison dams. At least for Leslie Harrison Dam, this would be a return to standard operating procedures prior to the drought, when the dam was routinely drawn down to 95 per cent of capacity to minimise the impacts of storms on downstream residents.

I also seek your confirmation that these options would not significantly impact upon our current water security, measured as the probability of needing to reintroduce Medium Level Restrictions over the next five to ten years.

[redacted]

Queensland Government

Office of the
Minister for Natural Resources, Mines and Energy and Minister for Trade

I emphasise that this is only a temporary measure, reflecting that dams are full prior to the commencement of the traditional wet season. I expect that your advice will include a clear date or trigger beyond which dams will be allowed to fill to their full supply level.

Thank you in advance for your assistance.

Should you have any further enquiries, please feel welcome to contact Mr John Bradley, Director General, Department of Environment and Resource Management on [redacted]

Yours sincerely

[redacted]

STEPHEN ROBERTSON MP

Level 17
61 Mary Street Brisbane 4000
PO Box 15216 City East
Queensland 4002 Australia
Telephone +61 7 3225 1861
Facsimile +61 7 3225 1828
Email nrmet@ministerial.qld.gov.au
ABN 65 959 415 158

[redacted]

From: [redacted]
Sent: Tuesday, 2 November 2010 11:50 AM
To: Dan Spiller
Subject: FW: TRIM Document : D/10/6978 : Letter from Stephen Robertson MP RE: Release of Water from Key Storages
Attachments: Letter from Stephen Robertson MP RE Release of Water from Key Storages.TIF

Categories: T3

Please prepare letter to Seqwater ASAP.

Regards

[redacted]
Executive Assistant to Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
[redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

-----Original Message-----
From: [redacted]
Sent: Friday, 29 October 2010 4:22 PM
To: [redacted]
Cc: Barry Dennien
Subject: FW: TRIM Document : D/10/6978 : Letter from Stephen Robertson MP RE: Release of Water from Key Storages

[redacted] The document was attached (not in TRIM), it is a scanned TIF file that you should be able to open as a picture. We don't have a word version, this was an original hard copy letter received that we scanned for our records.

If you still can't view it, can you please let Barry know and he can arrange for someone to fax it to you.

Regards
[redacted]

From: [redacted] On Behalf Of Barry Dennien
Sent: Friday, 29 October 2010 8:25 AM
To: [redacted]
Cc: [redacted]
Subject: TRIM Document : D/10/6978 : Letter from Stephen Robertson MP RE: Release of Water from Key Storages

[redacted] see attached copy of letter received from Minister Robertson.

A copy will be forwarded to the Board Secretary for inclusion in the next Board pack.

Regards

Barry Dennien

Chief Executive Officer
SEQ Water Grid Manager
Phone : (
Email:
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

------< TRIM Record Information >------

Record Number : D/10/6978
Title : Letter from Stephen Robertson MP RE: Release of Water from Key Storages

CC

CC

Queensland Government

Ref CTS 19311/10

25 OCT 2010

Office of the
Minister for Natural Resources, Mines and Energy and Minister for Trade

Mr [redacted]
Chair
SEQ Water Grid Manager
PO Box 16205
CITY EAST QLD 4002

Dear [redacted]

I write in relation to seeking advice regarding options to and benefits of releasing water from key storages in anticipation of major inflows over the coming summer.

I understand that the key Water Grid storages are at 100 per cent of storage capacity going into the traditional wet season, with forecasts of higher than median rainfall and the prospect of multiple flood events.

I am also advised that our water supply is more secure than ever before, due to storages being full, key Water Grid projects completed and ongoing water efficiency.

I seek your urgent advice about whether this water security provides an opportunity to reduce the volume stored in key dams as a means of reducing the severity, frequency and duration of flooding in downstream areas.

In doing so, I note that recent releases from Wivenhoe Dam have resulted in significant inconvenience and isolation for residents in some downstream areas. With the catchments saturated, I understand that even quite minor rainfall events will result in further water releases and further inconvenience for these residents.

By end November 2010, I would appreciate your advice as to the available options and the likely benefits. At a minimum, you should review the operation of Wivenhoe, North Pine and Leslie Harrison dams. At least for Leslie Harrison Dam, this would be a return to standard operating procedures prior to the drought, when the dam was routinely drawn down to 95 per cent of capacity to minimise the impacts of storms on downstream residents.

I also seek your confirmation that these options would not significantly impact upon our current water security, measured as the probability of needing to reintroduce Medium Level Restrictions over the next five to ten years.

Level 17
61 Mary Street Brisbane 4000
PO Box 15216 City East
Queensland 4002 Australia
Telephone +61 7 3225 1861
Facsimile +61 7 3225 1828
Email nrmet@ministerial.qld.gov.au
ABN 65 959 415 158

Queensland Government

Office of the
Minister for Natural Resources, Mines and Energy and Minister for Trade

I emphasise that this is only a temporary measure, reflecting that dams are full prior to the commencement of the traditional wet season. I expect that your advice will include a clear date or trigger beyond which dams will be allowed to fill to their full supply level.

Thank you in advance for your assistance.

Should you have any further enquiries, please feel welcome to contact Mr John Bradley, Director General, Department of Environment and Resource Management on [redacted]

Yours sincerely

[redacted]

STEPHEN ROBERTSON MP

Level 17
61 Mary Street Brisbane 4000
PO Box 15216 City East
Queensland 4002 Australia
Telephone +61 7 3225 1861
Facsimile +61 7 3225 1828
Email nrmet@ministerial.qld.gov.au
ABN 65 959 415 158

Karez Daley

From: [redacted] on behalf of Jim Pruss

Sent: Wednesday, 10 November 2010 3:57 PM
To: Dan Spiller
Cc: Jim Pruss
Subject: Dam full supply level (FSL) investigations (Draft document)
Attachments: WIVENHOE DAM - Storage Lowering Investigation.docx

Categories: T3

Hi Dan,

This is the draft advice received from Dam safety guys to date.

Suggest we discuss expectations/ other required details over the phone when convenient.

Once discussed, Seqwater can provide a formal response to meet Grid Manager expectations and Minister deadlines.

Jim

Jim Pruss
Executive General Manager, Water Delivery
QLD Bulk Water Supply Authority *trading as* Seqwater

Ph [redacted]
Level 4 240 Margaret Street, Brisbane City QLD 4000 Australia
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au



Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

DAM FULL SUPPLY LEVEL (FSL) INVESTIGATIONS
SEQWATER GATED STORAGES

INTRODUCTION

The following short paper examines the issues associated with temporary lowering the full supply levels of Seqwater's gated dams to improve short term flood mitigation benefits. The paper considers Wivenhoe Dam, Somerset Dam, North Pine Dam and Leslie Harrison Dam.

WIVENHOE DAM AND SOMERSET DAM

Wivenhoe Dam and Somerset dam control only 50% of the Brisbane River catchment (Bremer River and Lockyer Creek catchments are not controlled), therefore the Flood Mitigation benefits provided by the dam will depend on the rainfall distribution experienced during a flood event. This makes it difficult to quantify exactly the benefits of lowering the storage in anticipation of possible flood rains.

There are primarily two types of flood events that may occur in the Brisbane River Catchment. There are the smaller events that impact primarily on the rural bridges upstream of Moggill and the larger events that impact on urban areas in Brisbane. The threshold that separates these two events is a river flow of around 3500 cubic metres per second at Moggill. To understand the possible benefits of lowering the storage to reduce flooding impacts, it makes sense to discuss these two types of events separately.

Events Impacting on Bridges (Moggill Flow < 3500m^3/s) – Limited Urban Impacts

In recent history, flood events of this nature occurred in April 1989, February 1999 and October 2010. The flow characteristics of events of this type are shown in the following table.

Event	Wivenhoe Dam					
	Starting Level		Volume Of Inflow	Volume Of Outflow	Peak Outflow	Peak Water Level
	m AHD	%	ML	ML	m3/s	m AHD
Early April 1989	67.06	>100	690,000	690,000	1,620	69.78
Late April 1989	67.00	100	870,000	820,000	1,490	71.45
February 1999	63.92	<100	1,220,000	900,600	1,800	70.45
October 2010	67.03	>100	640,000	640,000	1,300	69.65

The October 2010 event was examined to determine the benefits of lowering the storage level. This event commenced with the dam at FSL. The event was examined with the dam at 95% capacity, 90% capacity, 80% capacity, 50% capacity and empty at the commencement of the event. The results are shown in the following table. When reading the table it is important to understand that the bridges are impacted not just by outflows from Wivenhoe, but also by flows from the uncontrolled areas of the river catchment. Accordingly, the location of a bridge within the system will dictate the size of catchment area that will impact on the bridge. All inundation times shown in the table are approximations only, made for the purposes of this investigation.

Dam Percentage Full at Event Commencement	Approximate Duration of Wivenhoe Radial Gate Releases/ Twin Bridges Inundation (hours)	Approximate Duration of Savages Crossing and Colleges Crossing Inundation (hours)	Approximate Duration of Burtons Bridge and Kholo Bridge Inundation (hours)	Peak Flow at Moggill (m^3/s)
100%	230	247	183	1848
95%	187	214	183	1848
90%	185	214	183	1841
80%	172	214	183	1786
50%	130	214	153	1722
0%	0	189	38	940

The table shows that the reduction in FSL won't have a large impact on Bridge inundation times. A reduction in the order or 36 hours or 15% of the total inundation time may be possible for the low level bridges only. The reductions are generally caused by the delay in release commencement associated with the lower starting FSL. However, the bridges can often already inundated at this time anyway due to flood inflows into the Brisbane River from the 50% of the catchment not controlled by Wivenhoe Dam. Lowering the FSL of the dam has no impact on such inundations as shown in the table.

For events smaller than those considered above, it should be noted that the Manual of Flood Mitigation allows a trigger level buffer of 27500 megalitres above FSL and this has the effect of protecting Twin Bridges and the lower level bridges from inundation as a result of minor events. Twin Bridges is essentially a low level causeway that is inundated following any radial gate release. This inundation could possibly be prevented by raising the bridge deck level. Regardless, the areas accessed using this bridge can also be accessed using the Fernvale Bridge. It is acknowledged however that the closing of Twin Bridges causes inconvenience to local residents, as it adds approximately another five kilometres to the journeys to and from their residences. Approximately 40 residences and several businesses (primarily turf farms) are impacted.

Events Impacting on Urban Areas (Moggill Flow > 3500m^3/s) – All rural bridges inundated

Events of this nature have not been experienced since the construction of Wivenhoe Dam was completed in 1984, with the last event of this nature being experienced in 1974. The inflow volume into Wivenhoe Dam associated with the 1974 event has been estimated to be in the order of 1.5 million megalitres. However during the 1974 event, an additional 1.5 million megalitres of flood flow impacting of the urban areas of Brisbane originated from catchment areas that are not controlled by Wivenhoe Dam.

For events of this nature, it is unlikely that peak water levels in Brisbane would be significantly impacted by minor reductions in the level of Wivenhoe Dam. Certainly reductions in dam volume in the order of at least 250000 megalitres would be needed to provide any significant reduction in water level peaks experienced in urban areas. Additionally, reductions in the FSL of this order would not necessarily guarantee reductions in urban flood levels, as the effectiveness of Wivenhoe Dam in reducing urban flood levels is

directly dependant on the distribution of rainfall in the Brisbane River catchment during a flood event (Wivenhoe Dam controls only 50% of the total Brisbane River catchment) and the spacing between individual flood events.

NORTH PINE DAM

North Pine Dam has no flood mitigation potential. Unlike Wivenhoe Dam, once the dam has reached FSL, all water flows into the dam must be released to protect the structural safety of the dam.

Any radial gate operation at North Pine Dam to release flood water, results in inundation of Youngs Crossing Road, so lowering the FSL is problematic and may best be achieved by increasing the daily water diversion to the North Pine Dam Water Treatment Plant. There are river release valves that allow some water to be drained from North Pine Dam without inundating Youngs Crossing. These valves have been operated continuously since the recent gate releases to manage residual inflows into the dam. However outflows from these valves are restricted to flows in the order of several hundred megalitres per day as larger flows will adversely impact on Youngs Crossing. Certainly a small reduction in the level of North Pine Dam is potentially beneficial in preventing closures of Youngs Crossing Road associated with small storm events.

It should be noted however that Youngs Crossing Road is also impacted by uncontrolled flood flows from Lake Kurwongbah and local storm run-off. In recent times Youngs Crossing Road has been closed by flood water during times when no water releases were being made from North Pine Dam, but when storm rains resulted in flood flows from uncontrolled areas of the catchment.

The table below gives an indication of the rainfall required to operate for NPD:

Level	Capacity			Rainfall Required to Operate	
				Wet Conditions	Dry Conditions
	m AHD	%	ML	mm	mm
FSL	39.60	100.0%	214,302	5	60
Reduced FSL	39.10	95.0%	203,618	35	100

Recent changes to the Manual of Flood Mitigation for North Pine Dam allows for some ability to retain up to 2500 megalitres of water to reduce impacts on Youngs Crossing Road, provided favourable weather forecasts are experienced. However the preferred option to reduce public inconvenience associated with storm events would be to raise the flood immunity of the river crossing on Youngs Crossing Road. This crossing is primarily a low level causeway that is potentially unsuitable given the volume of traffic that now uses this crossing on a daily basis.

LESLIE HARRISON DAM

Similar to North Pine Dam, Leslie Harrison Dam has no flood mitigation potential. Once the dam has reached FSL, all water flows into the dam must be released to protect the structural safety of the dam.

The dam is relatively small with a total full supply storage volume of only 24800 megalitres, against an inflow volume during a 72 hour 1 in 50 year storm event of over 30000 megalitres. Flood gate operations at Leslie Harrison Dam do not impact on public roads and generally only inconvenience the general public during large flood events. Reductions in this inconvenience cannot be achieved by small reductions in dam storage level.

[redacted]

From: Barry Dennien
Sent: Wednesday, 10 November 2010 4:31 PM
To: Dan Spiller
Subject: Re: Dam full supply level (FSL) investigations (Draft document)

Categories: T3

Let me read and discuss tomorrow

Regards
Barry Dennien

On 10/11/2010, at 4:07 PM, "Dan Spiller" <[redacted]> wrote:

For discussion. Suggests no change, other than potentially for North Pine.

Dan

From: [redacted] **On Behalf Of** Jim Pruss
Sent: Wednesday, 10 November 2010 3:57 PM
To: Dan Spiller
Cc: Jim Pruss
Subject: Dam full supply level (FSL) investigations (Draft document)

Hi Dan,

This is the draft advice received from Dam safety guys to date.

Suggest we discuss expectations/ other required details over the phone when convenient.

Once discussed, Seqwater can provide a formal response to meet Grid Manager expectations and Minister deadlines.

Jim

Jim Pruss

Executive General Manager, Water Delivery

QLD Bulk Water Supply Authority *trading as* Seqwater

<image001.png>

Ph [redacted]

Level 4 240 Margaret Street, Brisbane City QLD 4000 Australia
PO Box 16146, City East QLD 4002

Website | www.seqwater.com.au

<image002.jpg>

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

<WIVENHOE DAM - Storage Lowering Investigation.docx>

[redacted]

From: Barry Dennien
Sent: Thursday, 11 November 2010 8:52 AM
To: Dan Spiller
Cc: [redacted]
Subject: RE: Dam full supply level (FSL) investigations (Draft document)

Categories: T3

Dan

My first take on this preliminary advice is it is very superficial and does not get to the heart of questions asked.

1. It mainly deals with bridge impacts (localised impacts) and does not deal with the Brisbane river levels and flood impacts in the city other than, 1974 has 1.5 million ML from Wivenhoe and 1.5 million Ml downstream, so what about a rain event greater than 1974 with 2 million upstream and 2 million below how much benefit with another 250,000 ml of buffer give? What if the 3 million mix was spatially different, what is the probability what is the benefit?

2. Even the analysis of bridge impacts is superficial, some sensitivities around releasing lower rates that remain under bridge impact levels that still fit the "7 day rule" because we have greater flood buffer.

We need to call a meeting and scope with Seqwater the scenarios

[redacted] will set this up for Tuesday next week, if that is OK.

Regards

Barry

From: Dan Spiller
Sent: Wednesday, 10 November 2010 4:07 PM
To: Barry Dennien; [redacted]
Subject: FW: Dam full supply level (FSL) investigations (Draft document)

For discussion. Suggests no change, other than potentially for North Pine.

Dan

From: [redacted] **On Behalf Of** Jim Pruss
Sent: Wednesday, 10 November 2010 3:57 PM
To: Dan Spiller
Cc: Jim Pruss
Subject: Dam full supply level (FSL) investigations (Draft document)

Hi Dan,

This is the draft advice received from Dam safety guys to date.

Suggest we discuss expectations/ other required details over the phone when convenient.

Once discussed, Seqwater can provide a formal response to meet Grid Manager expectations and Minister deadlines.

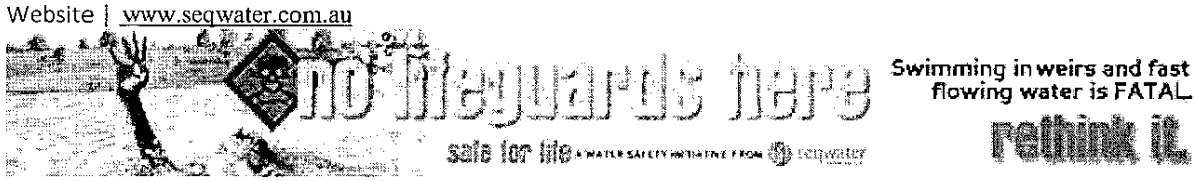
Jim

Jim Pruss
Executive General Manager, Water Delivery

QLD Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

Ph [redacted]
Level 4 240 Margaret Street, Brisbane City QLD 4000 Australia
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au



Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

Subject: Meeting to discuss: Dam full supply level (FSL) investigations
Location: CEO's office (Level 15, 53 Albert Street)

Start: Tue 23/11/2010 4:00 PM
End: Tue 23/11/2010 5:00 PM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Not yet responded

Organizer: Barry Dennien
Required Attendees: [redacted] Dan Spiller

Categories: T3



WIVENHOE DAM
Storage Lowerin..

From: [redacted] **On Behalf Of** Jim Pruss
Sent: Wednesday, 10 November 2010 3:57 PM
To: Dan Spiller
Cc: Jim Pruss
Subject: Dam full supply level (FSL) investigations (Draft document)

Hi Dan,

This is the draft advice received from Dam safety guys to date.

Suggest we discuss expectations/ other required details over the phone when convenient.

Once discussed, Seqwater can provide a formal response to meet Grid Manager expectations and Minister deadlines.

Jim

Jim Pruss
Executive General Manager, Water Delivery
QLD Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

DAM FULL SUPPLY LEVEL (FSL) INVESTIGATIONS
SEQWATER GATED STORAGES

INTRODUCTION

The following short paper examines the issues associated with temporary lowering the full supply levels of Seqwater's gated dams to improve short term flood mitigation benefits. The paper considers Wivenhoe Dam, Somerset Dam, North Pine Dam and Leslie Harrison Dam.

WIVENHOE DAM AND SOMERSET DAM

Wivenhoe Dam and Somerset dam control only 50% of the Brisbane River catchment (Bremer River and Lockyer Creek catchments are not controlled), therefore the Flood Mitigation benefits provided by the dam will depend on the rainfall distribution experienced during a flood event. This makes it difficult to quantify exactly the benefits of lowering the storage in anticipation of possible flood rains.

There are primarily two types of flood events that may occur in the Brisbane River Catchment. There are the smaller events that impact primarily on the rural bridges upstream of Moggill and the larger events that impact on urban areas in Brisbane. The threshold that separates these two events is a river flow of around 3500 cubic metres per second at Moggill. To understand the possible benefits of lowering the storage to reduce flooding impacts, it makes sense to discuss these two types of events separately.

Events Impacting on Bridges (Moggill Flow < 3500m^3/s) – Limited Urban Impacts

In recent history, flood events of this nature occurred in April 1989, February 1999 and October 2010. The flow characteristics of events of this type are shown in the following table.

Event	Wivenhoe Dam					
	Starting Level		Volume Of Inflow	Volume Of Outflow	Peak Outflow	Peak Water Level
	m AHD	%	ML	ML	m3/s	m AHD
Early April 1989	67.06	>100	690,000	690,000	1,620	69.78
Late April 1989	67.00	100	870,000	820,000	1,490	71.45
February 1999	63.92	<100	1,220,000	900,600	1,800	70.45
October 2010	67.03	>100	640,000	640,000	1,300	69.65

The October 2010 event was examined to determine the benefits of lowering the storage level. This event commenced with the dam at FSL. The event was examined with the dam at 95% capacity, 90% capacity, 80% capacity, 50% capacity and empty at the commencement of the event. The results are shown in the following table. When reading the table it is important to understand that the bridges are impacted not just by outflows from Wivenhoe, but also by flows from the uncontrolled areas of the river catchment. Accordingly, the location of a bridge within the system will dictate the size of catchment area that will impact on the bridge. All inundation times shown in the table are approximations only, made for the purposes of this investigation.

Dam Percentage Full at Event Commencement	Approximate Duration of Wivenhoe Radial Gate Releases/ Twin Bridges Inundation (hours)	Approximate Duration of Savages Crossing and Colleges Crossing Inundation (hours)	Approximate Duration of Burtons Bridge and Kholo Bridge Inundation (hours)	Peak Flow at Moggill (m^3/s)
100%	230	247	183	1848
95%	187	214	183	1848
90%	185	214	183	1841
80%	172	214	183	1786
50%	130	214	153	1722
0%	0	189	38	940

The table shows that the reduction in FSL won't have a large impact on Bridge inundation times. A reduction in the order or 36 hours or 15% of the total inundation time may be possible for the low level bridges only. The reductions are generally caused by the delay in release commencement associated with the lower starting FSL. However, the bridges can often already inundated at this time anyway due to flood inflows into the Brisbane River from the 50% of the catchment not controlled by Wivenhoe Dam. Lowering the FSL of the dam has no impact on such inundations as shown in the table.

For events smaller than those considered above, it should be noted that the Manual of Flood Mitigation allows a trigger level buffer of 27500 megalitres above FSL and this has the effect of protecting Twin Bridges and the lower level bridges from inundation as a result of minor events. Twin Bridges is essentially a low level causeway that is inundated following any radial gate release. This inundation could possibly be prevented by raising the bridge deck level. Regardless, the areas accessed using this bridge can also be accessed using the Fernvale Bridge. It is acknowledged however that the closing of Twin Bridges causes inconvenience to local residents, as it adds approximately another five kilometres to the journeys to and from their residences. Approximately 40 residences and several businesses (primarily turf farms) are impacted.

Events Impacting on Urban Areas (Moggill Flow > 3500m^3/s) – All rural bridges inundated

Events of this nature have not been experienced since the construction of Wivenhoe Dam was completed in 1984, with the last event of this nature being experienced in 1974. The inflow volume into Wivenhoe Dam associated with the 1974 event has been estimated to be in the order of 1.5 million megalitres. However during the 1974 event, an additional 1.5 million megalitres of flood flow impacting of the urban areas of Brisbane originated from catchment areas that are not controlled by Wivenhoe Dam.

For events of this nature, it is unlikely that peak water levels in Brisbane would be significantly impacted by minor reductions in the level of Wivenhoe Dam. Certainly reductions in dam volume in the order of at least 250000 megalitres would be needed to provide any significant reduction in water level peaks experienced in urban areas. Additionally, reductions in the FSL of this order would not necessarily guarantee reductions in urban flood levels, as the effectiveness of Wivenhoe Dam in reducing urban flood levels is

directly dependant on the distribution of rainfall in the Brisbane River catchment during a flood event (Wivenhoe Dam controls only 50% of the total Brisbane River catchment) and the spacing between individual flood events.

NORTH PINE DAM

North Pine Dam has no flood mitigation potential. Unlike Wivenhoe Dam, once the dam has reached FSL, all water flows into the dam must be released to protect the structural safety of the dam.

Any radial gate operation at North Pine Dam to release flood water, results in inundation of Youngs Crossing Road, so lowering the FSL is problematic and may best be achieved by increasing the daily water diversion to the North Pine Dam Water Treatment Plant. There are river release valves that allow some water to be drained from North Pine Dam without inundating Youngs Crossing. These valves have been operated continuously since the recent gate releases to manage residual inflows into the dam. However outflows from these valves are restricted to flows in the order of several hundred megalitres per day as larger flows will adversely impact on Youngs Crossing. Certainly a small reduction in the level of North Pine Dam is potentially beneficial in preventing closures of Youngs Crossing Road associated with small storm events.

It should be noted however that Youngs Crossing Road is also impacted by uncontrolled flood flows from Lake Kurwongbah and local storm run-off. In recent times Youngs Crossing Road has been closed by flood water during times when no water releases were being made from North Pine Dam, but when storm rains resulted in flood flows from uncontrolled areas of the catchment.

The table below gives an indication of the rainfall required to operate for NPD:

Level	Capacity			Rainfall Required to Operate	
				Wet Conditions	Dry Conditions
	m AHD	%	ML	mm	mm
FSL	39.60	100.0%	214,302	5	60
Reduced FSL	39.10	95.0%	203,618	35	100

Recent changes to the Manual of Flood Mitigation for North Pine Dam allows for some ability to retain up to 2500 megalitres of water to reduce impacts on Youngs Crossing Road, provided favourable weather forecasts are experienced. However the preferred option to reduce public inconvenience associated with storm events would be to raise the flood immunity of the river crossing on Youngs Crossing Road. This crossing is primarily a low level causeway that is potentially unsuitable given the volume of traffic that now uses this crossing on a daily basis.

LESLIE HARRISON DAM

Similar to North Pine Dam, Leslie Harrison Dam has no flood mitigation potential. Once the dam has reached FSL, all water flows into the dam must be released to protect the structural safety of the dam.

The dam is relatively small with a total full supply storage volume of only 24800 megalitres, against an inflow volume during a 72 hour 1 in 50 year storm event of over 30000 megalitres. Flood gate operations at Leslie Harrison Dam do not impact on public roads and generally only inconvenience the general public during large flood events. Reductions in this inconvenience cannot be achieved by small reductions in dam storage level.

[redacted]

From: Barry Dennien
Sent: Friday, 3 December 2010 3:06 PM
To: Rob Drury; Jim Pruss
Cc: Peter Borrows; Dan Spiller
Subject: RE: Dam levels - Investigation

Categories: T3

Rob

Thanks for the report. Thanks for the additional BOM advice.

I note the good work on modelled sensitivities for flows below 1900m3/sec – W1 strategy (flood manual)

The report then jumps to greater than 3500m3/sec (W4 strategy) and comments how peak water levels would unlikely be impacted and it comments that dam volume reductions of 250,000 megalitres (reduction 20% dam level) would be needed for any significant reduction in water level peaks.

Q1. Was the >3500m3/sec modelled like the October event < 1900M3/sec to draw the above conclusions.

Q2. Was the flow between 1900 and 3500 m3/sec modelled (Strategy W2 W3) with various dam levels to ascertain benefits to peak levels or bridge outage durations

Q3. If no to 1 and 2 is it worth doing considering we make the comments above about maybe a benefit if we have 250,000 ML extra storage.

Regards

Barry

From [redacted]
Sent: Thursday, 2 December 2010 3:11 PM
To: Barry Dennien; Jim Pruss
Cc: Peter Borrows
Subject: RE: Dam levels - Investigation

Barry,
Attached is our DRAFT reply on possibility and impact of lowering dam levels on floods for your review and any comments.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

Ph [redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Barry Dennien [redacted]
Sent: Wednesday, 1 December 2010 11:56 AM
To: Jim Pruss; Rob Drury
Subject: Dam levels - Investigation

Jim Rob

Hope all is well.

Just following up on our discussions with regards dam levels and flood impacts. Anything I can do to help?

We are due to get back to the Minister by the end of November.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
Phone [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Barry Dennien
Sent: Wednesday, 8 December 2010 8:23 AM
To: Jim Pruss; Rob Drury
Cc: Dan Spiller; Peter Borrows
Attachments: SEQ Water Grid Media Report - 8 December 2010 (2).pdf

Categories: T3

Hi Jim Rob

The Minister is attending our Board meeting this Monday and given the public debate on Wivenhoe levels is very much front of mind (attached) he will ask on the status of the modelling work. I received your update the other day thankyou, I had a few extra questions, is there any chance on your thoughts before Monday, not necessarily any new model runs before then.

Regards

Barry

Rob

Thanks for the report. Thanks for the additional BOM advice.

I note the good work on modelled sensitivities for flows below 1900m3/sec – W1 strategy (flood manual)

The report then jumps to greater than 3500m3/sec (W4 strategy) and comments how peak water levels would unlikely be impacted and it comments that dam volume reductions of 250,000 megalitres (reduction 20% dam level) would be needed for any significant reduction in water level peaks.

Q1. Was the >3500m3/sec modelled like the October event < 1900M3/sec to draw the above conclusions.

Q2. Was the flow between 1900 and 3500 m3/sec modelled (Strategy W2 W3) with various dam levels to ascertain benefits to peak levels or bridge outage durations

Q3. If no to 1 and 2 is it worth doing considering we make the comments above about maybe a benefit if we have 250,000 ML extra storage.

Regards

Barry

[redacted]

From: Mike Foste[redacted]
Sent: Wednesday, 8 December 2010 5:17 PM
To: Dan Spiller
Subject: Hinze Dam

Categories: T3

Dan,

Seeking some advice.

As you are aware Seqwater has permission to maintain Hinze Dam at the current FSL until construction is complete.

The project has now reached a critical path – to enable raising of the full supply level we need the removal of the rockfill in the spillway channel upstream of the emergency gate. This was placed to facilitate access for the 250t crane during construction.

Currently we have the emergency spillway gate open and discharging 65cumecs. With further rain the spillway gate will be used through to Thursday next week. While the gate is operating it is not possible for the rock fill to be excavated. The safest and most efficient way to get the rock fill out is to lower the storage by 1m or so below the existing FSL. If this can be negotiated it will take 3 days to excavate the rockfill from the approach channel using conventional excavators.

This work is the highest priority to complete prior to first filling and will force the project to continue to operate the emergency gate in January if not completed by Christmas. There is a reasonable chance that this work will be completed by the Christmas break is we can drain down the storage.

Would the WGM be comfortable with the Alliance briefly dropping the storage below FSL to allow excavation as part of finalising construction of the project. Given the projected rain forecasts we'll be back over FSL before we know it.

Will give you a call to discuss.

Cheers Mike

Mike Foster
Manager Strategic Relations & Communication
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

Ph [redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received

this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Thursday, 9 December 2010 12:11 PM
To: Barry Dennien; Jim Pruss
Cc: Dan Spiller; Peter Borrows
Subject: RE:
Attachments: image001.jpg; image002.png

Barry,

To question 1, no it wasn't modelled mainly because the bigger the event, the much less impact of the reduced FSL. But yes to Question 2 in that this was considered. However the following may help summarise and also offer a way to give the proposal a more detailed analysis in the future.

Basically, there are an unlimited number of scenarios containing an infinite number of rainfall patterns and distributions producing flood events in the Brisbane River for flows both above and below 3500 cumecs. Seqwater has not attempted to model each scenario in the discussion paper or even a variety of scenarios. A major study would be required to undertake this exercise and the study that Seqwater has been commissioned to undertake for the Water Commission relating to raising the Wivenhoe Dam Full Supply Level will consider these issues. This study is scheduled to commence in the new year and take in the order of six months.

The main point to be noted from the discussion paper is that having a relatively small volume of water to fill below the dam FSL provides only limited benefits and the larger the flood, the smaller these benefits will potentially be (although unusual rainfall patterns could produce exceptions). The reason for the reducing potential benefit as flood size increases is due to the reducing proportion of the available volume below FSL to the total flood volume. The other factor is that the available storage volume below FSL is generally only a very small proportion of the total flood storage unless the dam is below around 50% capacity.

Generally although the lower Wivenhoe Dam is at the commencement of the event, the smaller the downstream impacts, as the events get bigger the impact reduction will generally decrease and may be insignificant. And during smaller events, the impact is less significant anyway. Quantifying the exact size of the potential benefit for a range of scenarios will take a major study and as previously discussed, this work will commence in the new year.

Hence to gain any significant benefit, Wivenhoe would have to be considerably lower at the start of an event and assuming the dam would not be kept at 50% or 75% continually, the point to really consider is how does Seqwater lower the storage below FSL before an event. Once rain commences it will generally be too late, as a release strategy may already be optimised to control downstream flood impacts, so increasing releases to lower the storage level will likely worsen those downstream flood impacts. That is, if there are significant flows downstream, it is already too late to pre-release.

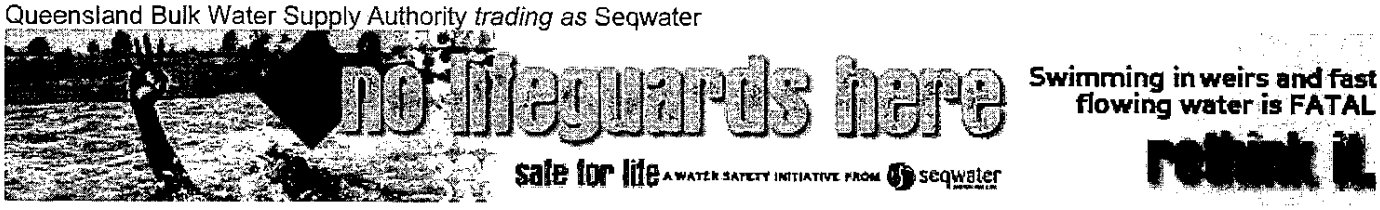
The other option is to pre-release based on forecast and before the rain event is underway. However, as seen in recent events, lowering storage levels based on forecast and before the event initiates, is a strategy containing many risks including:

- Causing unnecessary downstream impacts when rainfall below forecast levels is experienced.
- Standing accused of wasting precious water resources when rainfall below forecast levels is experienced.
- Unnecessarily extending bridge inundation times and disrupting irrigation activities downstream of Wivenhoe Dam.
- Unnecessarily increasing river turbidity downstream of Wivenhoe Dam.

In summary, much thought and investigation by many people has gone into developing the current Manual of Flood Mitigation for Wivenhoe and Somerset dams. The Manual should not be modified lightly and certainly not without suitable engineering investigations being undertaken. Seqwater will undertake extensive investigations for the Water Commission in the new year to examine the possibility of raising the full supply level of Wivenhoe Dam. At this stage it is suggested that the scope of this work be widened to consider not just raising the water level in the dam, but also examining in detail the costs and benefits of modifying the manual of Flood Mitigation to allow "pre-lowering" of storage levels based on forecast rainfall at the onset of potential flood events.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater





PH [redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Barry Dennien [redacted]
Sent: Wednesday, 8 December 2010 8:23 AM
To: Jim Pruss; Rob Drury
Cc: Dan Spiller; Peter Borrows
Subject:

Hi Jim Rob

The Minister is attending our Board meeting this Monday and given the public debate on Wivenhoe levels is very much front of mind (attached) he will ask on the status of the modelling work. I received your update the other day thankyou, I had a few extra questions, is there any chance on your thoughts before Monday, not necessarily any new model runs before then.

Regards

Barry

Rob

Thanks for the report. Thanks for the additional BOM advice.

I note the good work on modelled sensitivities for flows below 1900m3/sec – W1 strategy (flood manual)

The report then jumps to greater than 3500m3/sec (W4 strategy) and comments how peak water levels would unlikely be impacted and it comments that dam volume reductions of 250,000 megalitres (reduction 20% dam level) would be needed for any significant reduction in water level peaks.

Q1. Was the >3500m3/sec modelled like the October event < 1900M3/sec to draw the above conclusions.

Q2. Was the flow between 1900 and 3500 m3/sec modelled (Strategy W2 W3) with various dam levels to ascertain benefits to peak levels or bridge outage durations

Q3. If no to 1 and 2 is it worth doing considering we make the comments above about maybe a benefit if we have 250,000 ML extra storage.

Regards

Barry

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Litsupport Brisbane

From: Barry Dennien
Sent: Thursday, 9 December 2010 12:24 PM
To: Dan Spiller
Subject: Fwd: RE:
Attachments: Seqwater_No-Lifeguards-Here_email_strap; ATT00001.htm; cidimage001.png@01CA24E1.BDB90020; ATT00002.htm

What waff

Regards
Barry Dennien

Begin forwarded message:

From: Rob Drury <[redacted]>
Date: 9 December 2010 12:10:59 PM AEST
To: Barry Dennien <[redacted]>
Cc: Dan Spiller <[redacted]>, Peter Borrows [redacted]@seqwater.com.au>
Subject: RE:

Barry,

To question 1, no it wasn't modelled mainly because the bigger the event, the much less impact of the reduced FSL. But yes to Question 2 in that this was considered. However the following may help summarise and also offer a way to give the proposal a more detailed analysis in the future.

Basically, there are an unlimited number of scenarios containing an infinite number of rainfall patterns and distributions producing flood events in the Brisbane River for flows both above and below 3500 cumecs. Seqwater has not attempted to model each scenario in the discussion paper or even a variety of scenarios. A major study would be required to undertake this exercise and the study that Seqwater has been commissioned to undertake for the Water Commission relating to raising the Wivenhoe Dam Full Supply Level will consider these issues. This study is scheduled to commence in the new year and take in the order of six months.

The main point to be noted from the discussion paper is that having a relatively small volume of water to fill below the dam FSL provides only limited benefits and the larger the flood, the smaller these benefits will potentially be (although unusual rainfall patterns could produce exceptions). The reason for the reducing potential benefit as flood size increases is due to the reducing proportion of the available volume below FSL to the total flood volume. The other factor is that the available storage volume below FSL is generally only a very small proportion of the total flood storage unless the dam is below around 50% capacity.

Generally although the lower Wivenhoe Dam is at the commencement of the event, the smaller the downstream impacts, as the events get bigger the impact reduction will generally decrease and may be insignificant. And during smaller events, the impact is less significant anyway. Quantifying the exact size of the potential benefit for a range of scenarios will take a major study and as previously discussed, this work will commence in the new year.

Hence to gain any significant benefit, Wivenhoe would have to be considerably lower at the start of an event and assuming the dam would not be kept at 50% or 75% continually, the point to really consider is how does Seqwater lower the storage below FSL before an event. Once rain commences it will generally be too late, as a release strategy may already be optimised to control downstream flood impacts, so increasing releases to lower the storage level will likely worsen those downstream flood impacts. That is, if there are significant flows downstream, it is already too late to pre-release.

The other option is to pre-release based on forecast and before the rain event is underway. However, as seen in recent events, lowering storage levels based on forecast and before the event initiates, is a strategy containing many risks including:

- Causing unnecessary downstream impacts when rainfall below forecast levels is experienced.
- Standing accused of wasting precious water resources when rainfall below forecast levels is experienced.
- Unnecessarily extending bridge inundation times and disrupting irrigation activities downstream of Wivenhoe Dam.
- Unnecessarily increasing river turbidity downstream of Wivenhoe Dam.

In summary, much thought and investigation by many people has gone into developing the current Manual of Flood Mitigation for Wivenhoe and Somerset dams. The Manual should not be modified lightly and certainly not without suitable engineering investigations being undertaken. Seqwater will undertake extensive investigations for the Water Commission in the new year to examine the possibility of raising the full supply level of Wivenhoe Dam. At this stage it is suggested that the scope of this work be widened to consider not just raising the water level in the dam, but also examining in detail the costs and benefits of modifying the manual of Flood Mitigation to allow "pre-lowering" of storage levels based on forecast rainfall at the onset of potential flood events.

Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

[redacted]

From: Dan Spiller
Sent: Thursday, 9 December 2010 2:54 PM
To: [redacted]
Cc: [redacted]
Subject: FW: Hinze Dam

Categories: T3

[redacted]

Can you please prepare a paper showing that the impact of this change on water security is immaterial?

I would like the modelling done tomorrow if possible.

Regards,
Dan

From: Mike Foster [redacted]
Sent: Wednesday, 8 December 2010 5:17 PM
To: Dan Spiller
Subject: Hinze Dam

Dan,

Seeking some advice.

As you are aware Seqwater has permission to maintain Hinze Dam at the current FSL until construction is complete.

The project has now reached a critical path – to enable raising of the full supply level we need the removal of the rockfill in the spillway channel upstream of the emergency gate. This was placed to facilitate access for the 250t crane during construction.

Currently we have the emergency spillway gate open and discharging 65cumecs. With further rain the spillway gate will be used through to Thursday next week. While the gate is operating it is not possible for the rock fill to be excavated. The safest and most efficient way to get the rock fill out is to lower the storage by 1m or so below the existing FSL. If this can be negotiated it will take 3 days to excavate the rockfill from the approach channel using conventional excavators.

This work is the highest priority to complete prior to first filling and will force the project to continue to operate the emergency gate in January if not completed by Christmas. There is a reasonable chance that this work will be completed by the Christmas break is we can drain down the storage.

Would the WGM be comfortable with the Alliance briefly dropping the storage below FSL to allow excavation as part of finalising construction of the project. Given the projected rain forecasts we'll be back over FSL before we know it.

Will give you a call to discuss.

Cheers Mike

Mike Foster
Manager Strategic Relations & Communication
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

Ph [redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Mike Foster [redacted]
Sent: Friday, 10 December 2010 12:07 PM
To: Dan Spiller
Cc: Barton Maher
Subject: UREGENT REQUEST - Spillway Gate Operation Draw Down Buffer Recommendation
Attachments: Memo HDA Spillway Gate Operation Draw Down Buffer 101210.pdf; ATT08407.txt

Categories: T3

Hi Dan,

Details of the proposed drawdown at Hinze is detailed in the attached memo as discussed.

In summary the Hinze Dam Alliance has requested to be allowed to draw down the storage level to EL81. (from EL 82.2)

This would involve releasing approx 12,000ML or dropping the storage by approx 7.4%. Approx 32,000ML has been released during current event to maintain storage level at EL 82.2.

Seqwater and the Hinze Dam Alliance would like to continue the current gate operations at the current rate to drawdown the storage level to (would be able to reach this level by Wednesday. The gate will then be shut and the excavation of the rockfill at the upstream side of the spillway would be commenced immediately. The lower storage level would allow us to use conventional excavators and complete the works in around 3 days.

Given that there is still inflows into the dam from the catchment, it is likely that the water level would rise from EL81 up to EL81.5 or higher before Christmas.

If there is any chance of running the water security model this afternoon or first up Monday and providing a response that'd be greatly appreciated.

Cheers Mike

Mike Foster
Manager Strategic Relations & Communication
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

Ph (07) [redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Memo

TO: Barton Maher, Seqwater **DATE:** 10 December 2010

CC: [redacted]

FROM: [redacted]

SUBJECT: **Spillway Gate Operation Draw Down Buffer Recommendation**

Background

This memo has been prepared to outline the current spillway gate operations and request for a Stage 2 Full Supply Level (FSL) draw down buffer to minimise further disruption to the Hinze Dam construction schedule.

Operation of the emergency spillway outlet gate is required to manage and release flood water temporarily stored above the Stage 2 FSL of 82.20mAHD. The current flood event (gate opened 03/12/2010) has involved progressively increasing the gate setting over almost a week, with continued rainfall across the catchment and increasing catchment baseflow, including prolonged overflowing of Little Nerang Dam. The current flood water release flow rate from Hinze Dam is approximately 65m^3/s (at gate opening setting of 2550mm).

Baseflow and Reservoir Response Following Gate Closure

As per the Gate Operations Plan, reservoir draw down back to Stage 2 FSL following the flood peak is undertaken by maintaining the current gate setting until the water level is just above the Stage 2 FSL, then the gate is gradually closed as the level returns to 82.20mAHD. With baseflow continuing to drain into the reservoir, the water level is expected to rise again immediately after the gate is closed.

This behaviour was observed during the October 2010 flood event, as illustrated in Figure 1. The gate was maintained at the 750mm gate setting to draw down the reservoir, and then progressively closed at 82.20mAHD. Following closure, the reservoir water level took just over a week to creep back to the trigger level to re-initiate gate operations (82.41mAHD). For the October 2010 event, due to the available storage at the time, the reservoir water level peak occurred approximately three days after the peak of the inflows from the catchment upstream. Furthermore, the time to draw down the reservoir was relatively long due to the low flood water release rate (gate setting 750mm, flow rate 18m^3/s). Consequently the catchment baseflow draining into the reservoir had time to recede, such that the inflow at the time of closure was only minor. Note following gate closure, flood water had to be temporarily stored above the Stage 2 FSL for some period to avoid a sunny day release.

For the current flood event, the gate is currently operating at the 2550mm setting and releasing flood water from the dam at approximately 65m^3/s. Due to the significantly higher flood water release rate compared to the October 2010 event, the time to draw the reservoir back to Stage 2 FSL will be relatively quick (assuming no continuing rainfall events). As

such, only a small reduction in catchment baseflow is expected until the time of gate closure. With significant inflow still draining into the reservoir following closing the gate, the time needed for the water level to reach the trigger level to re-initiate gate operations will be short.

In accordance with the Gate Operations Plan, the volume of flood water that is temporarily stored above the Stage 2 FSL (82.20mADH) in the reservoir before the trigger level to initiate gate operations (82.41mAHD) is reached is 2,098ML. Similarly, the following table presents a range of catchment baseflows draining in the reservoir and the corresponding durations following gate closure for the reservoir water level to reach the trigger level to re-initiation of gate operations.

Net Catchment Baseflow Inflow Rate (m^3/s)	Period to Initiate Gate Operations (Days)
24.3	1
12.1	2
8.1	3
3.5	7
1.7	14

Storage Draw Down Buffer Recommendations

With the current catchment baseflow above $30m^3/s$, draw down of the reservoir should include an adequate storage buffer below Stage 2 FSL, so that baseflow can have sufficient time to recede and not re-initiate gate operations.

Assuming an average catchment baseflow of $10m^3/s$ draining into the reservoir following gate closure and to avoid re-initiation of gate operations for at least 2 weeks, a storage buffer in the order of 12,000ML would be required. This would mean reservoir drawn down to approximately 81.0mAHD (1.2m below Stage 2 FSL).

Potential Reservoir Inflow Probabilities – Historic Review

For a more historic view of reservoir behaviour, provided below is a long term look at hydrological behaviour of the catchment upstream of Hinze Dam, and the likely yield expected (inflow volumes).

The following table presents the storage volume below the Stage 2 FSL (82.20mAHD) at several storage elevations (80.0mAHD to 82.20mAHD), along with the probabilities of the reservoir receiving the inflow volumes to refill to Stage 2 FSL, during the individual months of January, February and March, and during the period from December till the end of April.

Figure 2 presents a plot of the storage volume below the Stage 2 FSL.

Storage Elevation (mAHD)	Storage Volume Below Stage 2 FSL (ML)	Potential Inflow Volume Probabilities to Return to Stage 2 Full Supply Level (82.20mAHD) *			
		During January (only)	During February (only)	During March (only)	December until the end of April (inclusive)
82.2 (S2 FSL)	0	100%	100%	100%	100%
82.0	1,968	50-75%	75-90%	75-90%	>90%
81.5	6,685	25-50%	50-75%	50-75%	>90%
81.0	11,402	25-50%	25-50%	50-75%	>90%
80.5	16,119	25-50%	25-50%	25-50%	75-90%
80.0	20,836	10-50%	25-50%	25-50%	75-90%

** The potential inflow volumes probabilities presented have been extracted from IQQM model developed and supplied by DERM. The model uses a simulation period of 110 years from 1890 to 2000.*

Summary

In summary, it is recommended that the current gate operations should include a draw down buffer below Stage 2 FSL, to limit further disruption to the construction schedule. Based on the current and expected catchment baseflow at the time of gate closure, drawing the reservoir down to 81.0mAHD (approximate 12,000ML buffer) is recommended.

As presented in the previous section, the long term historic hydrological behaviour of the catchment suggests that there is greater than 90% chance that if the reservoir is drawn down to 81.0mAHD, it will refill by the end of April 2011. With the current above average rainfall that has occurred over the last month and expected to continue throughout summer, refilling the reservoir is very much likely to occur during the 2011 wet season.

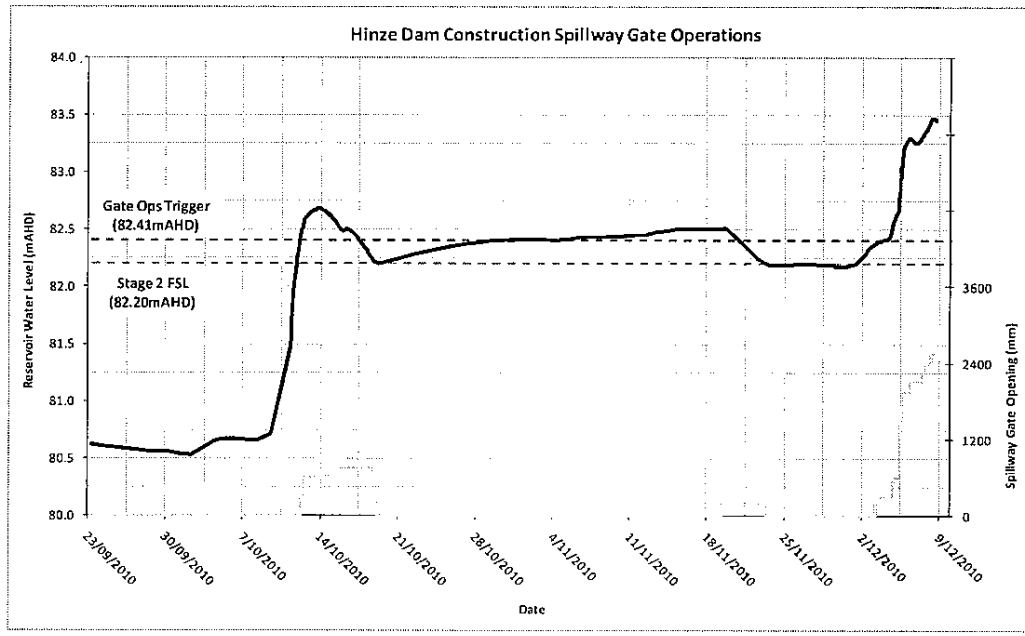


Figure 1 – Hinze Dam Construction Gate Operations (to date)

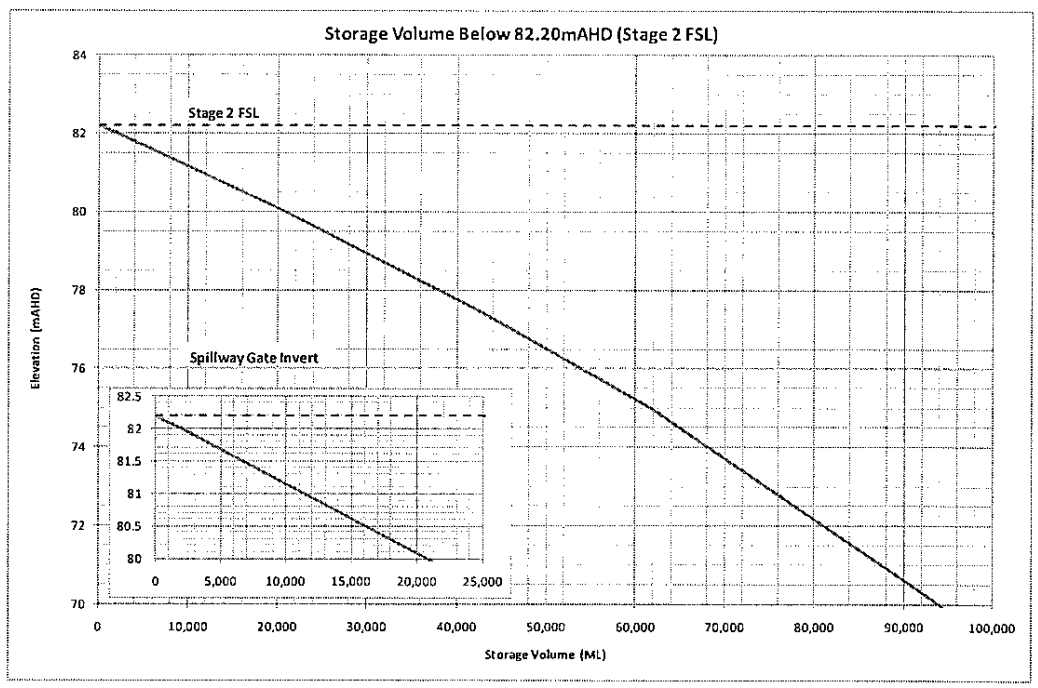


Figure 2 – Storage Volume Below 82.20mAHD (Stage 2 FSL)

[redacted]

From: Dan Spiller
Sent: Friday, 10 December 2010 12:10 PM
To: Mike Foster
Subject: RE: UREGENT REQUEST - Spillway Gate Operation Draw Down Buffer Recommendation

Categories: T3

Pls call me

From: Mike Foster [redacted]
Sent: Friday, 10 December 2010 12:07 PM
To: Dan Spiller
Cc: Barton Maher
Subject: UREGENT REQUEST - Spillway Gate Operation Draw Down Buffer Recommendation

Hi Dan,

Details of the proposed drawdown at Hinze is detailed in the attached memo as discussed.

In summary the Hinze Dam Alliance has requested to be allowed to draw down the storage level to EL81. (from EL 82.2)

This would involve releasing approx 12,000ML or dropping the storage by approx 7.4%. Approx 32,000ML has been released during current event to maintain storage level at EL 82.2.

Seqwater and the Hinze Dam Alliance would like to continue the current gate operations at the current rate to drawdown the storage level to (would be able to reach this level by Wednesday. The gate will then be shut and the excavation of the rockfill at the upstream side of the spillway would be commenced immediately. The lower storage level would allow us to use conventional excavators and complete the works in around 3 days.

Given that there is still inflows into the dam from the catchment, it is likely that the water level would rise from EL81 up to EL81.5 or higher before Christmas.

If there is any chance of running the water security model this afternoon or first up Monday and providing a response that'd be greatly appreciated.

Cheers Mike

Mike Foster
Manager Strategic Relations & Communication
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

Ph [redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any

transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Dan Spiller
Sent: Friday, 10 December 2010 12:18 PM
To: Mike Foster
Cc: Barton Maher[redacted]
Subject: RE: UREGENT REQUEST - Spillway Gate Operation Draw Down Buffer Recommendation

Categories: T3

Please call me.

I need to urgently confirm timeframes. My reading of the brief is that a response on Monday is too late to ensure project completion by Christmas.

As discussed with [redacted] can you please amend the briefing note to state:

- The reason for reducing dam levels (integrating and expanding upon what is in your email)
- Project status, especially the risks of it not being delivered by Christmas
- Whether there are any downstream impacts of continuing releases at 65 m3/sec rather than 18 m3/sec.

We have modelled a 1 metre reduction, and confirmed no water security impact. We will update this afternoon for 1.2 metres. On this basis, we are preparing:

- internal approval documents
- a brief for the Minister
- questions and answers.

Can you please help with the brief and questions and answers.

Thanks,
Dan

From: Mike Foster[redacted]
Sent: Friday, 10 December 2010 12:07 PM
To: Dan Spiller
Cc: Barton Maher
Subject: UREGENT REQUEST - Spillway Gate Operation Draw Down Buffer Recommendation

Hi Dan,

Details of the proposed drawdown at Hinze is detailed in the attached memo as discussed.

In summary the Hinze Dam Alliance has requested to be allowed to draw down the storage level to EL81. (from EL 82.2)

This would involve releasing approx 12,000ML or dropping the storage by approx 7.4%. Approx 32,000ML has been released during current event to maintain storage level at EL 82.2.

Seqwater and the Hinze Dam Alliance would like to continue the current gate operations at the current rate to drawdown the storage level to (would be able to reach this level by Wednesday. The gate will then be shut and the excavation of the rockfill at the upstream side of the spillway would be commenced immediately. The lower storage level would allow us to use conventional excavators and complete the works in around 3 days.

Given that there is still inflows into the dam from the catchment, it is likely that the water level would rise from EL81 up to EL81.5 or higher before Christmas.

If there is any chance of running the water security model this afternoon or first up Monday and providing a response that'd be greatly appreciated.

Cheers Mike

Mike Foster
Manager Strategic Relations & Communication
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Barton Maher [redacted]
Sent: Friday, 10 December 2010 12:20 PM
To: Dan Spiller
Subject: RE: UREGENT REQUEST - Spillway Gate Operation Draw Down Buffer Recommendation

Categories: T3

Hi Dan,

Can I have your contact number so I can call? I can chase down whatever information you need.

Regards,
Barton Maher
Principal Dams & Weirs Planning
QLD Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

Ph (07 [redacted]
Karalee Office, 68 Junction Rd Karalee QLD 4306 Australia
PO Box 2437, North Ipswich QLD 4305
Website | www.seqwater.com.au

From: Dan Spiller [redacted]
Sent: Friday, 10 December 2010 12:18 PM
To: Mike Foster
Cc: Barton Maher [redacted]
Subject: RE: UREGENT REQUEST - Spillway Gate Operation Draw Down Buffer Recommendation

Please call me.

I need to urgently confirm timeframes. My reading of the brief is that a response on Monday is too late to ensure project completion by Christmas.

As discussed with [redacted] can you please amend the briefing note to state:

- The reason for reducing dam levels (integrating and expanding upon what is in your email)
- Project status, especially the risks of it not being delivered by Christmas
- Whether there are any downstream impacts of continuing releases at 65 m3/sec rather than 18 m3/sec.

We have modelled a 1 metre reduction, and confirmed no water security impact. We will update this afternoon for 1.2 metres. On this basis, we are preparing:

- internal approval documents
- a brief for the Minister
- questions and answers.

Can you please help with the brief and questions and answers.

Thanks,
Dan

From: Mike Foster [redacted]
Sent: Friday, 10 December 2010 12:07 PM
To: Dan Spiller
Cc: Barton Maher
Subject: UREGENT REQUEST - Spillway Gate Operation Draw Down Buffer Recommendation

Hi Dan,

Details of the proposed drawdown at Hinze is detailed in the attached memo as discussed.

In summary the Hinze Dam Alliance has requested to be allowed to draw down the storage level to EL81. (from EL 82.2)

This would involve releasing approx 12,000ML or dropping the storage by approx 7.4%. Approx 32,000ML has been released during current event to maintain storage level at EL 82.2.

Seqwater and the Hinze Dam Alliance would like to continue the current gate operations at the current rate to drawdown the storage level to (would be able to reach this level by Wednesday. The gate will then be shut and the excavation of the rockfill at the upstream side of the spillway would be commenced immediately. The lower storage level would allow us to use conventional excavators and complete the works in around 3 days.

Given that there is still inflows into the dam from the catchment, it is likely that the water level would rise from EL81 up to EL81.5 or higher before Christmas.

If there is any chance of running the water security model this afternoon or first up Monday and providing a response that'd be greatly appreciated.

Cheers Mike

Mike Foster
Manager Strategic Relations & Communication
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

Ph [redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: [redacted]
Sent: Friday, 10 December 2010 12:35 PM
To: [redacted]
Cc: [redacted] Dan Spiller
Subject: FW: Spillway Gate Operation Draw Down Buffer Recommendation
Attachments: Memo HDA Spillway Gate Operation Draw Down Buffer 101210.pdf; ATT08407.txt

Categories: T3

Hi Barton

The attached memo talks about the likelihood of certain inflows being received based on the IQQM model and goes onto make the statement below...

With the current catchment baseflow above 30m3/s, draw down of the reservoir should include an adequate storage buffer below Stage 2 FSL, so that baseflow can have sufficient time to recede and not re-initiate gate operations.
Assuming an average catchment baseflow of 10m3/s draining into the reservoir following gate closure and to avoid re-initiation of gate operations for at least 2 weeks, a storage buffer in the order of 12,000ML would be required. This would mean

Is the 30 cumecs based on derived inflow records Seqwater are keeping?

Are we able to get a look at the last few weeks/months of the inflow records you are using for this statement, just to get a sense of how far along the tail of the hydrograph we are sitting and how extended this is in the Hinze catchment??

We are currently looking a probabilities of the dam returning to FSL using our WathNet model (similar to what has been presented using the IQQM simulation results) and the real time inflow information might just be another useful piece of information.

Ta

[redacted]
Water Engineer
SEQ Water Grid Manager
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

From: Dan Spiller
Sent: Friday, 10 December 2010 11:27 AM
To: [redacted]
Subject: FW: Spillway Gate Operation Draw Down Buffer Recommendation

From: [redacted]
Sent: Friday, 10 December 2010 11:22 AM
To: Dan Spiller
Subject: FW: Spillway Gate Operation Draw Down Buffer Recommendation

Dan,

I'll call you about this

[redacted]

[redacted]
Senior Communications Advisor
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au



From: Barton Maher
Sent: Friday, 10 December 2010 11:19
To [redacted]
Subject: FW: Spillway Gate Operation Draw Down Buffer Recommendation

Barton Maher
Principal Dams & Weirs Planning
QLD Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Karalee Office, 68 Junction Rd Karalee QLD 4306 Australia
PO Box 2437, North Ipswich QLD 4305
Website | www.seqwater.com.au

From: Barton Maher
Sent: Friday, 10 December 2010 11:18 AM
To: Mike Foster
Cc: Jim Pruss; Rob Drury
Subject: FW: Spillway Gate Operation Draw Down Buffer Recommendation

Hi Mike,

Details of the proposed drawdown at Hinze is detailed in the attached memo. Short version.

Seqwater and the Hinze Dam Alliance would like to continue gate operations at the current rate to drawdown the storage level to EL81. (would be able to reach this level by Wednesday. The gate will then be shut and the excavation of the rockfill at the upstream side of the spillway would be commenced immediately. The lower storage level would allow us to use conventional excavators and complete the works in around 3 days. Given that there is still inflows into the dam from the catchment, it is likely that the water level would rise from EL81 up to EL81.5 or higher before Christmas.

Can you pass by Dan Spiller please? We need the go ahead today to make this work.

Regards,
Barton Maher
Principal Dams & Weirs Planning
QLD Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Karalee Office, 68 Junction Rd Karalee QLD 4306 Australia
PO Box 2437, North Ipswich QLD 4305
Website | www.seqwater.com.au

From: [redacted]
Sent: Friday, 10 December 2010 10:57 AM
To: Barton Maher
Cc: [redacted] external forward; [redacted]
Subject: RE: Spillway Gate Operation Draw Down Buffer Recommendation

Barton,

With the current opening of the emergency gate, the reservoir will likely draw down to RL82.2 meaning a full gate closure this Sunday. Ideally if Seqwater are going to approved the additional buffer, we need to know today to allow us to keep the emergency gate *fully open* until we reach to approved buffer level which I am calculating as being next Thursday morning. Note that this would indeed leave us sufficient time to complete the rock excavation upstream.

However leaving the approval till Monday means we will need to decrease the emergency gate opening over the weekend, then not be able to increase the opening after approval, meaning longer to drain down to the new approved buffer, which ultimately means would not be able to complete the upstream excavation works prior to Christmas.

Regards,

[redacted]

Construction Manager | Thiess Pty Ltd
Hinze Dam Alliance | Hinze Dam Stage 3
Advancetown Rd | Advancetown QLD 4211
P 07 [redacted]
F 07
M 04
www.hinzedamalliance.com.au

From: [redacted]
Sent: Friday, 10 December 2010 10:05 AM

To: [redacted]
Cc: [redacted]
Subject: Spillway Gate Operation Draw Down Buffer Recommendation

Barton-

Please find attached a memo outlining our recommendation for a draw down buffer below the Stage 2 FSL to manage baseflow draining into the reservoir and limit further disruption to the Hinze Dam construction schedule.

It is worth mentioning, that should we not draw down the reservoir with a suitable buffer, the baseflow draining into the reservoir would quickly re-initiate gate operations. Following completion of the initial gate operation, river levels will drop and allow Weedons Crossing to re-open. The subsequent second flood wave will then mean a return of elevated river levels and Weedons Crossing may need to be closed again; which may impact the public if unaware.

[redacted]
Civil Engineer

Hinze Dam Stage 3

M: [redacted]

Post: PO Box 2346

Nerang Mail Centre, Queensland, 4211

Email: [redacted]

Web: www.hinzedamstage3.com

IMPORTANT - This email and any attachments may be confidential and privileged. If received in error, please contact Thiess and delete all copies. You may not rely on advice and documents received by email unless confirmed by a signed Thiess letter. This restriction on reliance will not apply to the extent that the above email communication is between parties to a contract and is authorised under that contract. Before opening or using attachments, check them for viruses and defects. Thiess' liability is limited to resupplying any affected attachments.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to

you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Memo

TO: [redacted] Seqwater **DATE:** 10 December 2010

CC: [redacted]

FROM: [redacted]

SUBJECT: **Spillway Gate Operation Draw Down Buffer Recommendation**

Background

This memo has been prepared to outline the current spillway gate operations and request for a Stage 2 Full Supply Level (FSL) draw down buffer to minimise further disruption to the Hinze Dam construction schedule.

Operation of the emergency spillway outlet gate is required to manage and release flood water temporarily stored above the Stage 2 FSL of 82.20mAHD. The current flood event (gate opened 03/12/2010) has involved progressively increasing the gate setting over almost a week, with continued rainfall across the catchment and increasing catchment baseflow, including prolonged overflowing of Little Nerang Dam. The current flood water release flow rate from Hinze Dam is approximately 65m^3/s (at gate opening setting of 2550mm).

Baseflow and Reservoir Response Following Gate Closure

As per the Gate Operations Plan, reservoir draw down back to Stage 2 FSL following the flood peak is undertaken by maintaining the current gate setting until the water level is just above the Stage 2 FSL, then the gate is gradually closed as the level returns to 82.20mAHD. With baseflow continuing to drain into the reservoir, the water level is expected to rise again immediately after the gate is closed.

This behaviour was observed during the October 2010 flood event, as illustrated in Figure 1. The gate was maintained at the 750mm gate setting to draw down the reservoir, and then progressively closed at 82.20mAHD. Following closure, the reservoir water level took just over a week to creep back to the trigger level to re-initiate gate operations (82.41mAHD). For the October 2010 event, due to the available storage at the time, the reservoir water level peak occurred approximately three days after the peak of the inflows from the catchment upstream. Furthermore, the time to draw down the reservoir was relatively long due to the low flood water release rate (gate setting 750mm, flow rate 18m^3/s). Consequently the catchment baseflow draining into the reservoir had time to recede, such that the inflow at the time of closure was only minor. Note following gate closure, flood water had to be temporarily stored above the Stage 2 FSL for some period to avoid a sunny day release.

For the current flood event, the gate is currently operating at the 2550mm setting and releasing flood water from the dam at approximately 65m^3/s. Due to the significantly higher flood water release rate compared to the October 2010 event, the time to draw the reservoir back to Stage 2 FSL will be relatively quick (assuming no continuing rainfall events). As

such, only a small reduction in catchment baseflow is expected until the time of gate closure. With significant inflow still draining into the reservoir following closing the gate, the time needed for the water level to reach the trigger level to re-initiate gate operations will be short.

In accordance with the Gate Operations Plan, the volume of flood water that is temporarily stored above the Stage 2 FSL (82.20mADH) in the reservoir before the trigger level to initiate gate operations (82.41mAHD) is reached is 2,098ML. Similarly, the following table presents a range of catchment baseflows draining in the reservoir and the corresponding durations following gate closure for the reservoir water level to reach the trigger level to re-initiation of gate operations.

Net Catchment Baseflow Inflow Rate (m^3/s)	Period to Initiate Gate Operations (Days)
24.3	1
12.1	2
8.1	3
3.5	7
1.7	14

Storage Draw Down Buffer Recommendations

With the current catchment baseflow above $30m^3/s$, draw down of the reservoir should include an adequate storage buffer below Stage 2 FSL, so that baseflow can have sufficient time to recede and not re-initiate gate operations.

Assuming an average catchment baseflow of $10m^3/s$ draining into the reservoir following gate closure and to avoid re-initiation of gate operations for at least 2 weeks, a storage buffer in the order of 12,000ML would be required. This would mean reservoir drawn down to approximately 81.0mAHD (1.2m below Stage 2 FSL).

Potential Reservoir Inflow Probabilities – Historic Review

For a more historic view of reservoir behaviour, provided below is a long term look at hydrological behaviour of the catchment upstream of Hinze Dam, and the likely yield expected (inflow volumes).

The following table presents the storage volume below the Stage 2 FSL (82.20mAHD) at several storage elevations (80.0mAHD to 82.20mAHD), along with the probabilities of the reservoir receiving the inflow volumes to refill to Stage 2 FSL, during the individual months of January, February and March, and during the period from December till the end of April.

Figure 2 presents a plot of the storage volume below the Stage 2 FSL.

Storage Elevation (mAHD)	Storage Volume Below Stage 2 FSL (ML)	Potential Inflow Volume Probabilities to Return to Stage 2 Full Supply Level (82.20mAHD) *			
		During January (only)	During February (only)	During March (only)	December until the end of April (inclusive)
82.2 (S2 FSL)	0	100%	100%	100%	100%
82.0	1,968	50-75%	75-90%	75-90%	>90%
81.5	6,685	25-50%	50-75%	50-75%	>90%
81.0	11,402	25-50%	25-50%	50-75%	>90%
80.5	16,119	25-50%	25-50%	25-50%	75-90%
80.0	20,836	10-50%	25-50%	25-50%	75-90%

** The potential inflow volumes probabilities presented have been extracted from IQQM model developed and supplied by DERM. The model uses a simulation period of 110 years from 1890 to 2000.*

Summary

In summary, it is recommended that the current gate operations should include a draw down buffer below Stage 2 FSL, to limit further disruption to the construction schedule. Based on the current and expected catchment baseflow at the time of gate closure, drawing the reservoir down to 81.0mAHD (approximate 12,000ML buffer) is recommended.

As presented in the previous section, the long term historic hydrological behaviour of the catchment suggests that there is greater than 90% chance that if the reservoir is drawn down to 81.0mAHD, it will refill by the end of April 2011. With the current above average rainfall that has occurred over the last month and expected to continue throughout summer, refilling the reservoir is very much likely to occur during the 2011 wet season.

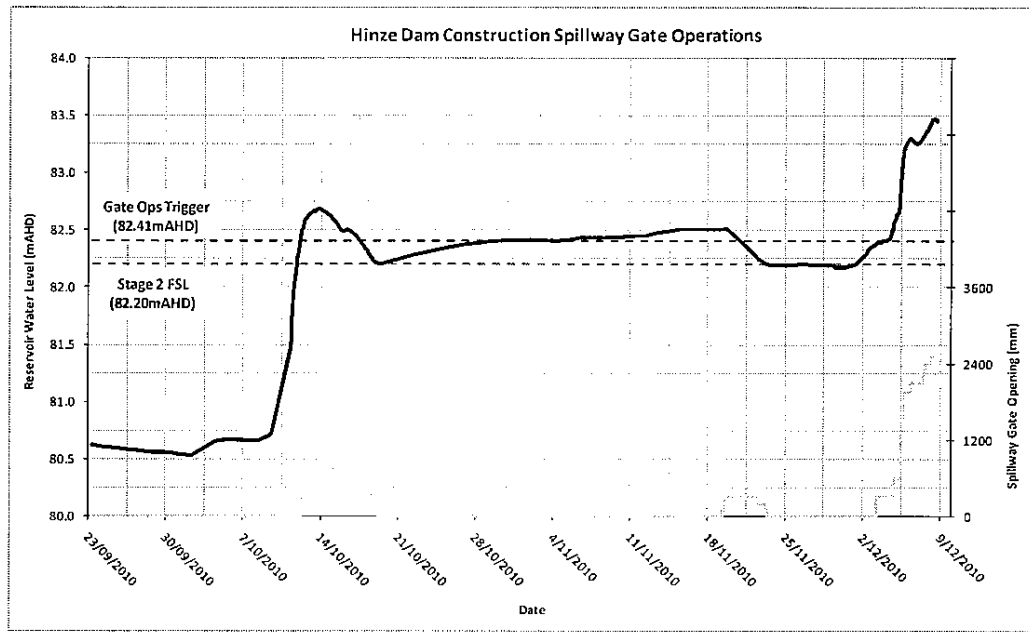


Figure 1 – Hinze Dam Construction Gate Operations (to date)

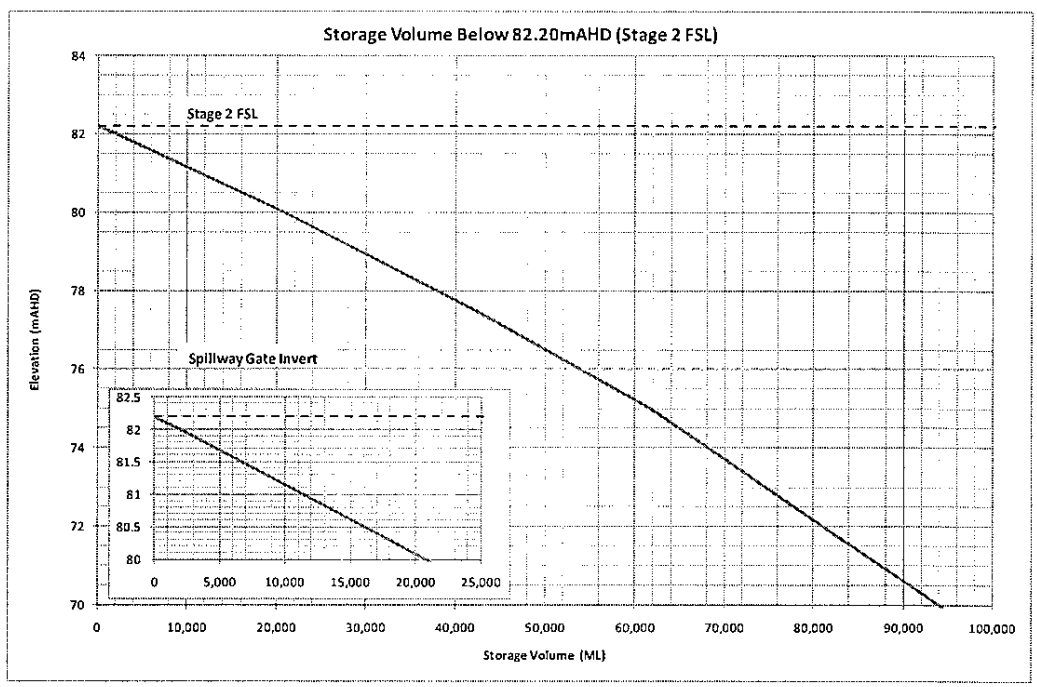


Figure 2 – Storage Volume Below 82.20mAHD (Stage 2 FSL)

[redacted]

From: Barton Maher [redacted]
Sent: Friday, 10 December 2010 2:37 PM
To: [redacted]
Cc: Dan Spiller
Subject: FW: Spillway Gate Operation Draw Down Buffer Recommendation
Attachments: Memo HDA Spillway Gate Operation Draw Down Buffer 101210.pdf; ATT13359.txt

Categories: T3

Revised Memo with additional data as requested.

Barton Maher
Principal Dams & Weirs Planning
QLD Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Karalee Office, 68 Junction Rd Karalee QLD 4306 Australia
PO Box 2437, North Ipswich QLD 4305
Website | www.seqwater.com.au

From: [redacted]
Sent: Friday, 10 December 2010 1:17 PM
To: Barton Maher
Cc: [redacted]
Subject: RE: Spillway Gate Operation Draw Down Buffer Recommendation

Barton,

Updated memo as requested.

Regards,
[redacted]

From: Barton Maher [redacted]
Sent: Friday, 10 December 2010 11:47 AM
To: [redacted]
Cc: [redacted]
Subject: RE: Spillway Gate Operation Draw Down Buffer Recommendation

Hi Gents,

I have been requested to amend [redacted] memo to get more info on why we need to do the work, why it is important and the need for doing it now. I also need the memo to show that the releases are not impacting anyone (i.e. a photo of the golf course crossing and how we are monitoring the flows. I have spoken to [redacted].

Regards,
Barton Maher
Principal Dams & Weirs Planning
QLD Bulk Water Supply Authority *trading as* Seqwater

[redacted]
Karalee Office, 68 Junction Rd Karalee QLD 4306 Australia
PO Box 2437, North Ipswich QLD 4305
Website | www.seqwater.com.au

From: [redacted]
Sent: Friday, 10 December 2010 10:57 AM
To: Barton Maher
Cc: [redacted]
Subject: RE: Spillway Gate Operation Draw Down Buffer Recommendation

Barton,

With the current opening of the emergency gate, the reservoir will likely draw down to RL82.2 meaning a full gate closure this Sunday. Ideally if Seqwater are going to approved the additional buffer, we need to know today to allow us to keep the emergency gate *fully open* until we reach to approved buffer level which I am calculating as being next Thursday morning. Note that this would indeed leave us sufficient time to complete the rock excavation upstream.

However leaving the approval till Monday means we will need to decrease the emergency gate opening over the weekend, then not be able to increase the opening after approval, meaning longer to drain down to the new approved buffer, which ultimately means would not be able to complete the upstream excavation works prior to Christmas.

Regards,

[redacted]

Construction Manager | Thiess Pty Ltd
Hinze Dam Alliance | Hinze Dam Stage 3
Advancetown Rd | Advancetown QLD 4211
[redacted]
www.hinzedamalliance.com.au

From: [redacted]
Sent: Friday, 10 December 2010 10:05 AM
To: [redacted]
Cc: [redacted]
Subject: Spillway Gate Operation Draw Down Buffer Recommendation

Barton-

Please find attached a memo outlining our recommendation for a draw down buffer below the Stage 2 FSL to manage baseflow draining into the reservoir and limit further disruption to the Hinze Dam construction schedule.

It is worth mentioning, that should we not draw down the reservoir with a suitable buffer, the baseflow draining into the reservoir would quickly re-initiate gate operations. Following completion of the initial gate operation, river levels will drop and allow Weedons Crossing to re-open. The subsequent second flood wave will then mean a return of elevated river levels and Weedons Crossing may need to be closed again; which may impact the public if unaware

[redacted]
Civil Engineer

Hinze Dam Stage 3
M: [redacted]
Post: PO Box 2346
Nerang Mail Centre, Queensland, 4211
Email: [redacted]
Web: www.hinzedamstage3.com

IMPORTANT - This email and any attachments may be confidential and privileged.

If received in error, please contact Thiess and delete all copies. You may not rely on advice and documents received by email unless confirmed by a signed Thiess letter. This restriction on reliance will not apply to the extent that the above email communication is between parties to a contract and is authorised under that contract.

Before opening or using attachments, check them for viruses and defects. Thiess' liability is limited to resupplying any affected attachments.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Click here to report this email as spam.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Memo

TO: Barton Maher, Seqwater **DATE:** 10 December 2010

CC: [redacted]

FROM: [redacted]

SUBJECT: **Spillway Gate Operation Draw Down Buffer Recommendation**

Background

This memo has been prepared to outline the current spillway gate operations and request for a Stage 2 Full Supply Level (FSL) draw down buffer to minimise further disruption to the Hinze Dam construction schedule.

Operation of the emergency spillway outlet gate is required to manage and release flood water temporarily stored above the Stage 2 FSL of 82.20mAHD. The current flood event (gate opened 03/12/2010) has involved progressively increasing the gate setting over almost a week, with continued rainfall across the catchment and increasing catchment baseflow, including prolonged overflowing of Little Nerang Dam. The current flood water release flow rate from Hinze Dam is approximately 65m^3/s (at gate opening setting of 2550mm).

Downstream of the site, Weedons Crossing is overflowing and was monitored as per plan when first closed. The Grand Golf Club access has not been impacted by the current flood water release, with the causeway remained opened at the current flow rate (see plate below).

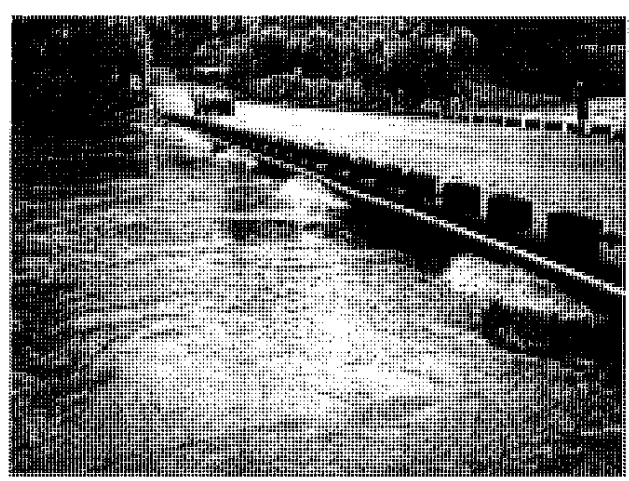


Plate 1 – Grand Golf Club

The draw down buffer is required to complete the critical construction task of excavating the rockfill in the channel upstream of the spillway. Removal of the rockfill must be completed

before the reservoir can be approved to commence storing water above Stage 2 FSL, as it is required:

- To ensure that the spillway and emergency spillway outlet have the required hydraulic capacity; and
- To minimise the risk of rockfill being drawn through the slide gate during gate operations.

In recent weeks this task has not been possible with high reservoir water levels and while the spillway outlet gate is in operation. The works include excavation of rockfill down to EL73m in the area directly upstream of the spillway outlet and the approach channel to EL75m from the spillway through to the main reservoir body. Temporarily drawing the reservoir below the Stage 2 FSL will provide a buffer to future gate operations due to continued reservoir inflows while these works are completed.

Baseflow and Reservoir Response Following Gate Closure

As per the Gate Operations Plan, reservoir draw down back to Stage 2 FSL following the flood peak is undertaken by maintaining the current gate setting until the water level is just above the Stage 2 FSL, then the gate is gradually closed as the level returns to 82.20mAHD. With baseflow continuing to drain into the reservoir, the water level is expected to progressively rise again after the gate is closed.

This behaviour was observed during the October 2010 flood event, as illustrated in Figure 1. The gate was maintained at the 750mm gate setting to draw down the reservoir, and then progressively closed at 82.20mAHD. Following closure, the reservoir water level took just over a week to creep back to the trigger level to re-initiate gate operations (82.41mAHD). For the October 2010 event, due to the available storage at the time, the reservoir water level peak occurred approximately three days after the peak of the inflows from the catchment upstream. Furthermore, the time to draw down the reservoir was relatively long due to the low flood water release rate (gate setting 750mm, flow rate 18m^3/s). Consequently the catchment baseflow draining into the reservoir had time to recede, such that the inflow at the time of closure was only minor. Note following gate closure, flood water had to be temporarily stored above the Stage 2 FSL for some period to avoid a sunny day release.

For the current flood event, the gate is currently operating at the 2550mm setting and releasing flood water from the dam at approximately 65m^3/s. Due to the significantly higher flood water release rate compared to the October 2010 event, the time to draw the reservoir back to Stage 2 FSL will be relatively quick (assuming no continuing rainfall events). As such, only a small reduction in catchment baseflow is expected until the time of gate closure. With significant inflow still draining into the reservoir following closing the gate, the time needed for the water level to reach the trigger level to re-initiate gate operations will be short.

In accordance with the Gate Operations Plan, the volume of flood water that is temporarily stored above the Stage 2 FSL (82.20mADH) in the reservoir before the trigger level to initiate gate operations (82.41mAHD) is reached is 2,098ML. Similarly, the following table presents

a range of catchment baseflows draining in the reservoir and the corresponding durations following gate closure for the reservoir water level to reach the trigger level to re-initiation of gate operations.

Net Catchment Baseflow Inflow Rate (m^3/s)	Period to Initiate Gate Operations (Days)
24.3	1
12.1	2
8.1	3
3.5	7
1.7	14

Storage Draw Down Buffer Recommendations

With the current catchment baseflow approximately $30m^3/s$, draw down of the reservoir should include an adequate storage buffer below Stage 2 FSL, so that baseflow can have sufficient time to recede and not re-initiate gate operations.

Assuming an average catchment baseflow of $10m^3/s$ draining into the reservoir following gate closure and to avoid re-initiation of gate operations for at least 2 weeks, a storage buffer in the order of 12,000ML would be required. This would mean reservoir drawn down to approximately 81.0mAHD (1.2m below Stage 2 FSL).

Potential Reservoir Inflow Probabilities – Historic Review

For a more historic view of reservoir behaviour, provided below is a long term look at hydrological behaviour of the catchment upstream of Hinze Dam, and the likely yield expected (inflow volumes).

The following table presents the storage volume below the Stage 2 FSL (82.20mAHD) at several storage elevations (80.0mAHD to 82.20mAHD), along with the probabilities of the reservoir receiving the inflow volumes to refill to Stage 2 FSL, during the individual months of January, February and March, and during the period from December till the end of April.

Figure 2 presents a plot of the storage volume below the Stage 2 FSL.

Storage Elevation (mAHD)	Storage Volume Below Stage 2 FSL (ML)	Potential Inflow Volume Probabilities to Return to Stage 2 Full Supply Level (82.20mAHD) *			
		During January (only)	During February (only)	During March (only)	December until the end of April (inclusive)
82.2 (S2 FSL)	0	100%	100%	100%	100%
82.0	1,968	50-75%	75-90%	75-90%	>90%
81.5	6,685	25-50%	50-75%	50-75%	>90%
81.0	11,402	25-50%	25-50%	50-75%	>90%
80.5	16,119	25-50%	25-50%	25-50%	75-90%
80.0	20,836	10-25%	25-50%	25-50%	75-90%

** The potential inflow volumes probabilities presented have been extracted from IQQM model developed and supplied by DERM. The model uses a simulation period of 110 years from 1890 to 2000.*

Summary

In summary, it is recommended that the current gate operations should include a draw down buffer below Stage 2 FSL, to limit further disruption to the construction schedule and allow the critical construction task of excavating rockfill upstream of the spillway to be completed. Based on the current and expected catchment baseflow at the time of gate closure, drawing the reservoir down to 81.0mAHD (approximate 12,000ML buffer) is recommended. To draw the reservoir down from the Stage 2 FSL to 81.0mAHD at the current release rate will take in the order of 2 to 3 days (depending on inflow draining into the reservoir).

As presented in the previous section, the long term historic hydrological behaviour of the catchment suggests that there is greater than 90% chance that if the reservoir is drawn down to 81.0mAHD, it will refill by the end of April 2011. With the current above average rainfall that has occurred over the last month and expected to continue throughout summer, refilling the reservoir is very much likely to occur during the 2011 wet season.

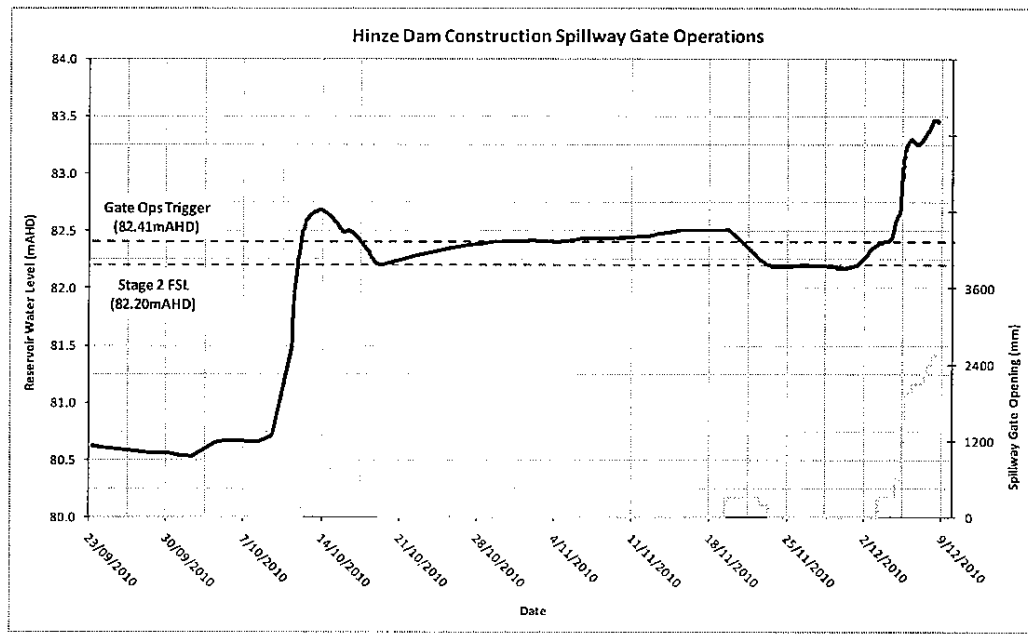


Figure 1 – Hinze Dam Construction Gate Operations (to date)

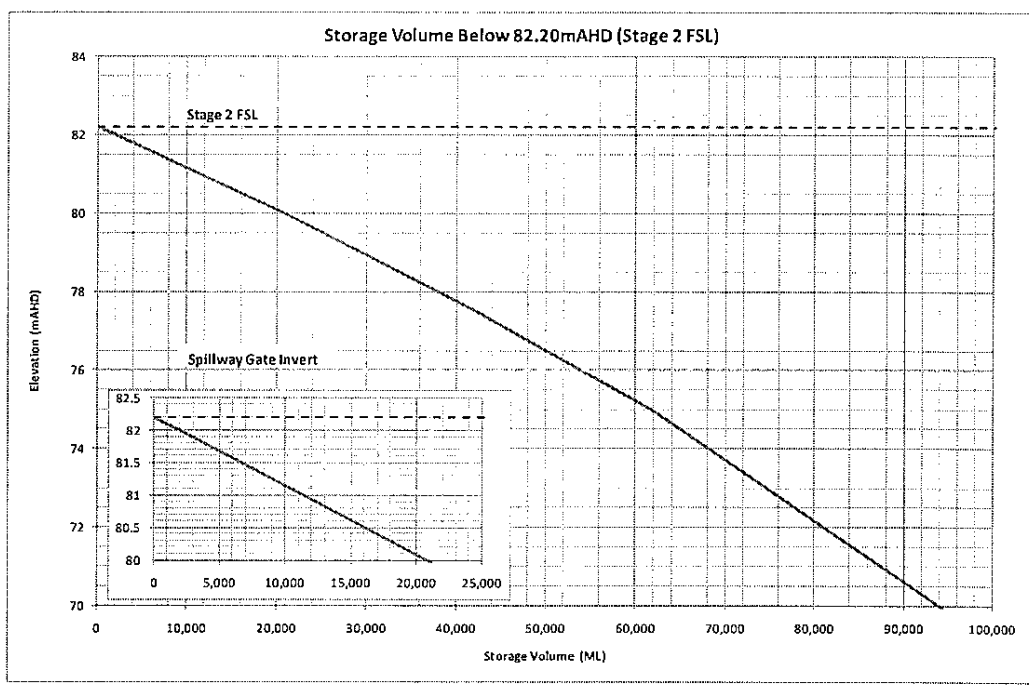


Figure 2 – Storage Volume Below 82.20mAHD (Stage 2 FSL)

[redacted]

From: Barton Maher [redacted]
Sent: Friday, 10 December 2010 2:38 PM
To: [redacted]
Cc: Dan Spiller; [redacted]
Subject: FW: Spillway Gate Operation Draw Down Buffer Recommendation
Attachments: nerang.csv

Categories: T3

Hi [redacted]

If you would like additional hydrograph data please email Terry Malone.

Regards,
Barton Maher
Principal Dams & Weirs Planning
QLD Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

Ph (07) [redacted]
Karalee Office, 68 Junction Rd Karalee QLD 4306 Australia
PO Box 2437, North Ipswich QLD 4305
Website | www.seqwater.com.au

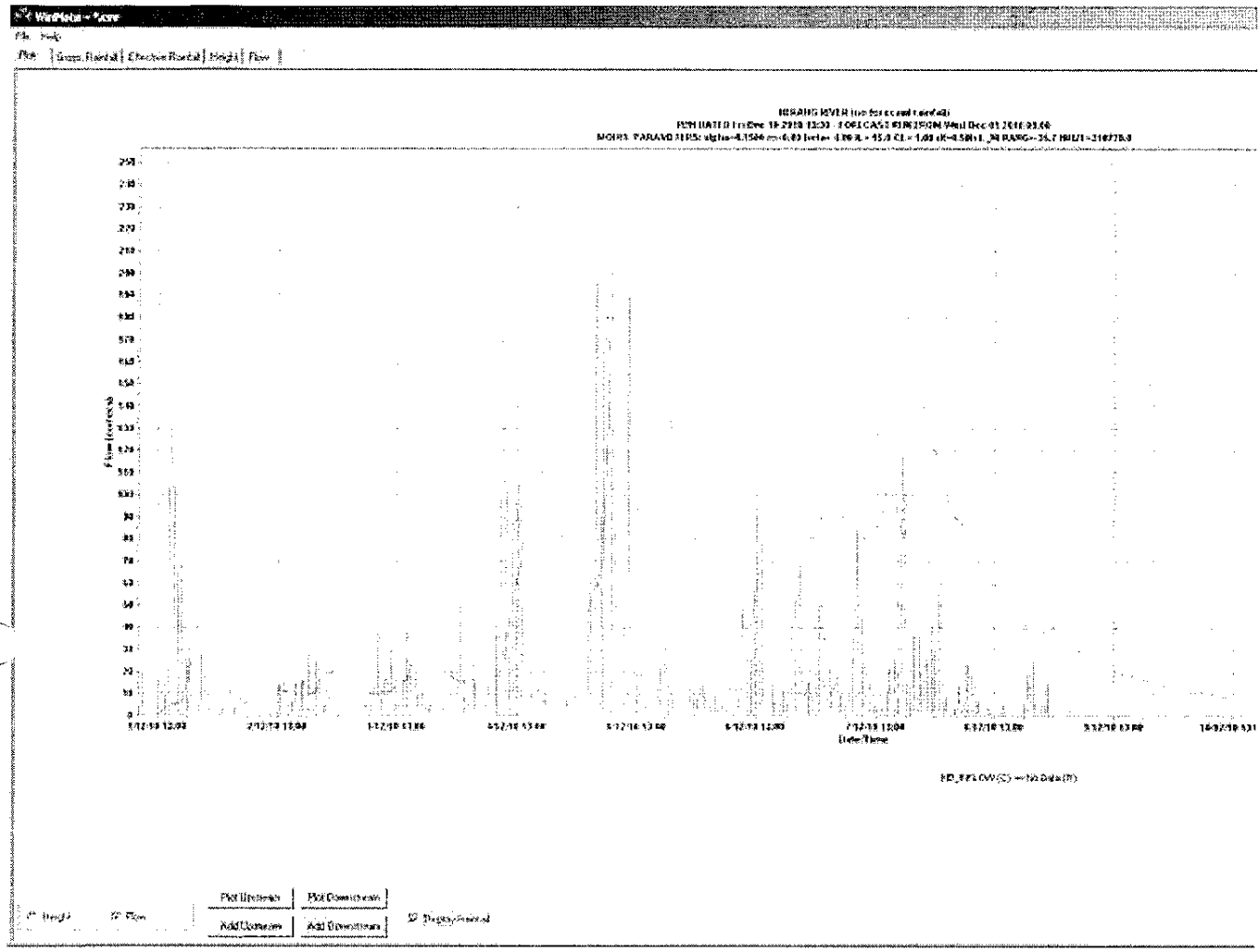
From: Terry Malone
Sent: Friday, 10 December 2010 1:40 PM
To: Barton Maher; [redacted]
Subject: RE: Spillway Gate Operation Draw Down Buffer Recommendation

Barton

Below is my estimate of the inflow to Hinze Dam since 01/12/2010. It is also contained in the attached csv file. It suggests that the current inflow to Hinze is about 20 m3/s and with no more rain will halve every 24 hours. However, you should note that BoM is predicting widespread 50mm with isolated 100mm of rain in SE Qld commencing Saturday before easing during Sunday. I suggest the catchment above Hinze will get more than this.

The estimate inflow hydrograph is based upon the recorded hydrographs at Numinbah and Little Nerang with allowance for local runoff from catchment area downstream of these stations.

Terry



From: Barton Maher
Sent: Friday, 10 December 2010 12:58 PM
To: [redacted] Terry Malone
Subject: RE: Spillway Gate Operation Draw Down Buffer Recommendation

Hi [redacted]

The 30cumecs is the current measured flow in the Nerang and Numinbah arms of the storage. The 10 cumecs is an assumption based on the estimated inflows to the storage over the last three months. We have operated the gates three times to releases water and keep the dam at EL82.2.

I will try and get a couple of hydrographs for you form the last couple of inflow events.

Hi Terry,

Can I get the inflow hydrographs for the last lot of floods into Hinze?

Regards,
Barton Maher
Principal Dams & Weirs Planning
QLD Bulk Water Supply Authority *trading as* Seqwater

[redacted]
Karalee Office, 68 Junction Rd Karalee QLD 4306 Australia
PO Box 2437, North Ipswich QLD 4305
Website | www.seqwater.com.au

From: [redacted]
Sent: Friday, 10 December 2010 12:35 PM
To: Barton Maher
Cc: [redacted] Dan Spiller
Subject: FW: Spillway Gate Operation Draw Down Buffer Recommendation

Hi Barton

The attached memo talks about the likelihood of certain inflows being received based on the IQQM model and goes onto make the statement below...

With the current catchment baseflow above 30m3/s, draw down of the reservoir should include an adequate storage buffer below Stage 2 FSL, so that baseflow can have sufficient time to recede and not re-initiate gate operations.
Assuming an average catchment baseflow of 10m3/s draining into the reservoir following gate closure and to avoid re-initiation of gate operations for at least 2 weeks, a storage buffer in the order of 12,000ML would be required. This would mean

Is the 30 cumecs based on derived inflow records Seqwater are keeping?

Are we able to get a look at the last few weeks/months of the inflow records you are using for this statement, just to get a sense of how far along the tail of the hydrograph we are sitting and how extended this is in the Hinze catchment??

We are currently looking a probabilities of the dam returning to FSL using our WathNet model (similar to what has been presented using the IQQM simulation results) and the real time inflow information might just be another useful piece of information.

Ta

[redacted]
Water Engineer
SEQ Water Grid Manager
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

From: Dan Spiller
Sent: Friday, 10 December 2010 11:27 AM
To: [redacted]
Subject: FW: Spillway Gate Operation Draw Down Buffer Recommendation

From: [redacted]
Sent: Friday, 10 December 2010 11:22 AM

To: Dan Spiller
Subject: FW: Spillway Gate Operation Draw Down Buffer Recommendation

Dan,

I'll call you about this

[redacted]

[redacted]
Senior Communications Advisor
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au



From: Barton Maher
Sent: Friday, 10 December 2010 11:19
To: [redacted]
Subject: FW: Spillway Gate Operation Draw Down Buffer Recommendation

Barton Maher
Principal Dams & Weirs Planning
QLD Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

Ph (07) [redacted]
Karalee Office, 68 Junction Rd Karalee QLD 4306 Australia
PO Box 2437, North Ipswich QLD 4305
Website | www.seqwater.com.au

From: Barton Maher
Sent: Friday, 10 December 2010 11:18 AM
To: Mike Foster
Cc: Jim Pruss; Rob Drury
Subject: FW: Spillway Gate Operation Draw Down Buffer Recommendation

Hi Mike,

Details of the proposed drawdown at Hinze is detailed in the attached memo. Short version.

Seqwater and the Hinze Dam Alliance would like to continue gate operations at the current rate to drawdown the storage level to EL81. (would be able to reach this level by Wednesday. The gate will then be shut and the excavation of the rockfill at the upstream side of the spillway would be commenced immediately. The lower storage level would allow us to use conventional excavators and complete the works in around 3 days. Given that there is still inflows into the dam from the catchment, it is likely that the water level would rise from EL81 up to EL81.5 or higher before Christmas.

Can you pass by Dan Spiller please? We need the go ahead today to make this work.

Regards,

Barton Maher
Principal Dams & Weirs Planning
QLD Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Karalee Office, 68 Junction Rd Karalee QLD 4306 Australia
PO Box 2437, North Ipswich QLD 4305
Website | www.seqwater.com.au

From: [redacted]
Sent: Friday, 10 December 2010 10:57 AM
To: Barton Maher
Cc: [redacted]
Subject: RE: Spillway Gate Operation Draw Down Buffer Recommendation

Barton,

With the current opening of the emergency gate, the reservoir will likely draw down to RL82.2 meaning a full gate closure this Sunday. Ideally if Seqwater are going to approved the additional buffer, we need to know today to allow us to keep the emergency gate *fully open* until we reach to approved buffer level which I am calculating as being next Thursday morning. Note that this would indeed leave us sufficient time to complete the rock excavation upstream.

However leaving the approval till Monday means we will need to decrease the emergency gate opening over the weekend, then not be able to increase the opening after approval, meaning longer to drain down to the new approved buffer, which ultimately means would not be able to complete the upstream excavation works prior to Christmas.

Regards,

Peter

Construction Manager | Thiess Pty Ltd
Hinze Dam Alliance | Hinze Dam Stage 3
Advancetown Rd | Advancetown QLD 4211
[redacted]
www.hinzedamalliance.com.au

From: [redacted]
Sent: Friday, 10 December 2010 10:05 AM
To: [redacted]

Cc: [redacted]
Subject: Spillway Gate Operation Draw Down Buffer Recommendation

Barton-

Please find attached a memo outlining our recommendation for a draw down buffer below the Stage 2 FSL to manage baseflow draining into the reservoir and limit further disruption to the Hinze Dam construction schedule.

It is worth mentioning, that should we not draw down the reservoir with a suitable buffer, the baseflow draining into the reservoir would quickly re-initiate gate operations. Following completion of the initial gate operation, river levels will drop and allow Weedons Crossing to re-open. The subsequent second flood wave will then mean a return of elevated river levels and Weedons Crossing may need to be closed again; which may impact the public if unaware

[redacted]

Civil Engineer

Hinze Dam Stage 3

M: [redacted]

Post: PO Box 2346

Nerang Mail Centre, Queensland, 4211

Email: [redacted]

Web: www.hinzedamstage3.com

IMPORTANT - This email and any attachments may be confidential and privileged. If received in error, please contact Thiess and delete all copies. You may not rely on advice and documents received by email unless confirmed by a signed Thiess letter. This restriction on reliance will not apply to the extent that the above email communication is between parties to a contract and is authorised under that contract. Before opening or using attachments, check them for viruses and defects. Thiess' liability is limited to resupplying any affected attachments.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the

material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Gross Rain	NUMINBAI	LND_INFL(	L_NERANG	HD_INFLO'	HINZE_DA	CLEARVIEW
40513.4	0.15	0.06	0.06	0.08	0.08	0.08
40513.42	1.37	1.32	1.32	0.58	0.58	0.52
40513.44	0.81	0.61	0.61	0.33	0.33	0.3
40513.46	0.36	0.55	0.55	0.16	0.16	0.15
40513.48	0.11	0.17	0.17	0.05	0.05	0.04
40513.5	0.07	0.12	0.12	0.03	0.03	0.03
40513.52	0.09	0.15	0.15	0.05	0.05	0.05
40513.54	0.04	0.06	0.06	0.05	0.05	0.06
40513.56	0.83	1.07	1.07	0.5	0.5	0.46
40513.58	0.48	0.54	0.54	0.52	0.52	0.48
40513.6	0.21	0.17	0.17	0.27	0.27	0.26
40513.63	0.21	0.21	0.21	0.44	0.44	0.42
40513.65	3.86	0.35	0.35	2.97	2.97	2.68
40513.67	4.87	4.77	4.77	3.71	3.71	3.38
40513.69	4.37	2.62	2.62	3	3	2.71
40513.71	1.78	1.53	1.53	1.88	1.88	1.7
40513.73	2.23	2.5	2.5	2.39	2.39	2.16
40513.75	2.91	2.02	2.02	2.01	2.01	1.84
40513.77	0.76	0.61	0.61	1.46	1.46	1.57
40513.79	1.05	0.92	0.92	0.77	0.77	0.74
40513.81	0.61	0.75	0.75	0.87	0.87	0.84
40513.83	0.93	0.97	0.97	0.72	0.72	0.66
40513.85	0.2	0.27	0.27	0.18	0.18	0.18
40513.88	0.16	0.22	0.22	0.15	0.15	0.15
40513.9	0.21	0.44	0.44	0.16	0.16	0.14
40513.92	1.83	1.94	1.94	0.81	0.81	0.72
40513.94	1.15	1.72	1.72	0.53	0.53	0.47
40513.96	0.59	0.7	0.7	0.28	0.28	0.25
40513.98	1.08	1.37	1.37	0.49	0.49	0.44
40514	0.27	0.31	0.31	0.12	0.12	0.11
40514.02	0	0.02	0.02	0	0	0
40514.04	0.01	0.03	0.03	0.01	0.01	0.01
40514.06	0.04	0.07	0.07	0.02	0.02	0.02
40514.08	0.1	0.15	0.15	0.09	0.09	0.08
40514.1	0.12	0.16	0.16	0.11	0.11	0.09
40514.13	0.12	0.32	0.32	0.13	0.13	0.12
40514.15	1.13	1.4	1.4	0.5	0.5	0.45
40514.17	0.47	0.49	0.49	0.21	0.21	0.19
40514.19	0.16	0.14	0.14	0.16	0.16	0.14
40514.21	0.4	0.43	0.43	0.35	0.35	0.32
40514.23	0.4	0.38	0.38	0.33	0.33	0.29
40514.25	0.28	0.16	0.16	0.22	0.22	0.2
40514.27	0.17	0.12	0.12	0.16	0.16	0.14
40514.29	0.08	0.17	0.17	0.22	0.22	0.2
40514.31	0.17	0.3	0.3	0.11	0.11	0.11
40514.33	0.02	0.02	0.02	0.01	0.01	0.02
40514.35	0	0	0	0	0	0.01
40514.38	0	0	0	0	0	0
40514.4	0	0	0	0.01	0.01	0.01
40514.42	0	0	0	0.03	0.03	0.03
40514.44	0	0	0	0.03	0.03	0.03
40514.46	0	0	0	0.03	0.03	0.03
40514.48	0	0	0	0.03	0.03	0.03
40514.5	0	0	0	0.03	0.03	0.03
40514.52	0.01	0.04	0.04	0.02	0.02	0.03

40514.54	0.04	0.08	0.08	0.08	0.08	0.09
40514.56	0.73	1.12	1.12	0.41	0.41	0.4
40514.58	0.72	0.98	0.98	0.48	0.48	0.46
40514.6	0.61	0.82	0.82	0.45	0.45	0.44
40514.63	0.83	0.9	0.9	0.55	0.55	0.65
40514.65	0.36	0.26	0.26	0.2	0.2	0.19
40514.67	0.12	0.21	0.21	0.17	0.17	0.18
40514.69	0.1	0.17	0.17	0.17	0.17	0.17
40514.71	0.34	0.41	0.41	0.43	0.43	0.38
40514.73	0.25	0.38	0.38	0.25	0.25	0.23
40514.75	0.77	1.11	1.11	0.46	0.46	0.41
40514.77	0.88	0.86	0.86	0.48	0.48	0.43
40514.79	0.37	0.26	0.26	0.25	0.25	0.24
40514.81	0.28	0.63	0.63	0.83	0.83	0.77
40514.83	0.86	0.39	0.39	0.67	0.67	0.63
40514.85	0.37	0.19	0.19	0.35	0.35	0.36
40514.88	0.12	0.27	0.27	0.74	0.74	0.86
40514.9	0.15	0.25	0.25	0.68	0.68	0.85
40514.92	0.02	0.05	0.05	0.01	0.01	0.01
40514.94	0.08	0.23	0.23	0.14	0.14	0.13
40514.96	0.44	0.74	0.74	0.44	0.44	0.39
40514.98	0.56	0.72	0.72	0.28	0.28	0.25
40515	0.29	0.37	0.37	0.16	0.16	0.14
40515.02	0.13	0.16	0.16	0.09	0.09	0.08
40515.04	0.14	0.12	0.12	0.09	0.09	0.12
40515.06	0.05	0.05	0.05	0.05	0.05	0.05
40515.08	0.03	0.03	0.03	0.05	0.05	0.05
40515.1	0.02	0.03	0.03	0.03	0.03	0.03
40515.13	0.02	0.03	0.03	0.02	0.02	0.02
40515.15	0.12	0.18	0.18	0.06	0.06	0.05
40515.17	0.02	0.03	0.03	0.01	0.01	0.01
40515.19	0.04	0.07	0.07	0.02	0.02	0.02
40515.21	0.25	0.17	0.17	0.14	0.14	0.12
40515.23	0.15	0.14	0.14	0.1	0.1	0.09
40515.25	0.05	0.13	0.13	0.06	0.06	0.06
40515.27	0.22	0.39	0.39	0.16	0.16	0.15
40515.29	0.03	0.09	0.09	0.16	0.16	0.19
40515.31	0.11	0.08	0.08	0.32	0.32	0.31
40515.33	0.18	0.15	0.15	0.25	0.25	0.25
40515.35	0.19	0.17	0.17	0.38	0.38	0.37
40515.38	0.2	0.58	0.58	0.4	0.4	0.36
40515.4	2.35	2.06	2.06	1.08	1.08	0.97
40515.42	0.21	0.16	0.16	0.22	0.22	0.23
40515.44	0.6	0.67	0.67	0.46	0.46	0.46
40515.46	0.65	0.29	0.29	0.54	0.54	0.54
40515.48	0.26	0.29	0.29	0.44	0.44	0.47
40515.5	0.91	1.34	1.34	0.85	0.85	0.82
40515.52	0.62	0.88	0.88	1	1	1.01
40515.54	0.26	0.41	0.41	0.16	0.16	0.16
40515.56	0.2	0.24	0.24	0.17	0.17	0.16
40515.58	0.42	0.45	0.45	0.32	0.32	0.3
40515.6	0.81	0.92	0.92	0.49	0.49	0.46
40515.63	1.18	1.44	1.44	1.08	1.08	1.01
40515.65	0.89	1.24	1.24	1.38	1.38	1.49
40515.67	0.68	1.23	1.23	0.96	0.96	0.87
40515.69	0.78	0.73	0.73	0.43	0.43	0.41

40515.71	0.9	1.08	1.08	0.67	0.67	0.62
40515.73	0.37	0.33	0.33	0.27	0.27	0.26
40515.75	0.13	0.09	0.09	0.16	0.16	0.17
40515.77	0.15	0.11	0.11	0.31	0.31	0.41
40515.79	0.26	0.07	0.07	0.16	0.16	0.19
40515.81	0.11	0.04	0.04	0.09	0.09	0.1
40515.83	0	0.17	0.17	0.15	0.15	0.15
40515.85	0	0.1	0.1	0.07	0.07	0.06
40515.88	0	0	0	0.01	0.01	0.01
40515.9	0.01	0.05	0.05	0.02	0.02	0.01
40515.92	0.03	0.07	0.07	0.02	0.02	0.02
40515.94	0.18	0.17	0.17	0.11	0.11	0.1
40515.96	0.22	0.12	0.12	0.15	0.15	0.14
40515.98	0.22	0.09	0.09	0.15	0.15	0.14
40516	0.21	0.17	0.17	0.16	0.16	0.15
40516.02	1.42	1.85	1.85	0.7	0.7	0.62
40516.04	0.19	0.14	0.14	0.19	0.19	0.2
40516.06	0.65	0.28	0.28	0.63	0.63	0.62
40516.08	2.7	3.02	3.02	1.45	1.45	1.33
40516.1	0.83	0.77	0.77	0.55	0.55	0.53
40516.13	0.25	0.18	0.18	0.28	0.28	0.29
40516.15	0.1	0.13	0.13	0.18	0.18	0.19
40516.17	0.24	0.09	0.09	0.23	0.23	0.21
40516.19	1.2	0.24	0.24	0.79	0.79	0.7
40516.21	0.87	0.74	0.74	0.45	0.45	0.4
40516.23	0.13	0.13	0.13	0.12	0.12	0.11
40516.25	0.13	0.13	0.13	0.12	0.12	0.11
40516.27	0.14	0.14	0.14	0.14	0.14	0.13
40516.29	0.12	0.08	0.08	0.15	0.15	0.15
40516.31	0.31	0.21	0.21	0.38	0.38	0.37
40516.33	0.29	0.25	0.25	0.31	0.31	0.3
40516.35	0.29	0.26	0.26	0.32	0.32	0.29
40516.38	1.24	1.04	1.04	1.21	1.21	1.11
40516.4	1.82	1.36	1.36	1.05	1.05	0.98
40516.42	2.07	2.63	2.63	2.89	2.89	2.79
40516.44	5.45	7.37	7.37	5.04	5.04	4.8
40516.46	4.52	3.44	3.44	2.94	2.94	2.85
40516.48	2.03	2.09	2.09	1.51	1.51	1.41
40516.5	1.33	1.06	1.06	0.86	0.86	0.8
40516.52	4.32	3.71	3.71	2.51	2.51	2.29
40516.54	4.81	3.7	3.7	2.78	2.78	2.72
40516.56	2.55	3.49	3.49	3.02	3.02	3.07
40516.58	2.95	2.74	2.74	2.9	2.9	2.85
40516.6	1.82	1.31	1.31	1.45	1.45	1.36
40516.63	1.21	1.04	1.04	0.67	0.67	0.6
40516.65	1.18	1.35	1.35	0.96	0.96	0.86
40516.67	1.17	0.63	0.63	0.62	0.62	0.55
40516.69	0.37	0.59	0.59	0.56	0.56	0.5
40516.71	2.25	1.88	1.88	1.34	1.34	1.2
40516.73	1	0.96	0.96	0.52	0.52	0.46
40516.75	0.33	0.29	0.29	0.28	0.28	0.25
40516.77	0.96	1.2	1.2	0.62	0.62	0.56
40516.79	0.77	0.68	0.68	0.33	0.33	0.29
40516.81	0	0	0	0	0	0
40516.83	0	0	0	0	0	0
40516.85	0	0	0	0	0	0

40516.88	0	0	0	0	0	0
40516.9	0.05	0.08	0.08	0.03	0.03	0.03
40516.92	0.08	0.11	0.11	0.08	0.08	0.09
40516.94	0.1	0.05	0.05	0.1	0.1	0.11
40516.96	0.19	0.2	0.2	0.19	0.19	0.2
40516.98	0.15	0.15	0.15	0.22	0.22	0.22
40517	0.17	0.19	0.19	0.29	0.29	0.31
40517.02	0.43	0.64	0.64	0.44	0.44	0.41
40517.04	0.76	0.74	0.74	0.41	0.41	0.38
40517.06	0.14	0.11	0.11	0.12	0.12	0.13
40517.08	0.31	0.34	0.34	0.24	0.24	0.24
40517.1	0.25	0.24	0.24	0.26	0.26	0.26
40517.13	0.15	0.13	0.13	0.49	0.49	0.68
40517.15	0.46	0.94	0.94	1.51	1.51	1.87
40517.17	1.02	1.99	1.99	1.98	1.98	1.97
40517.19	1.55	2.74	2.74	1.68	1.68	1.59
40517.21	7.37	9.5	9.5	5.68	5.68	5.39
40517.23	6.06	6.1	6.1	3.48	3.48	3.5
40517.25	0.93	1.41	1.41	2.63	2.63	3.36
40517.27	0.54	4.22	4.22	4.85	4.85	4.75
40517.29	3.24	6.37	6.37	5.32	5.32	5.17
40517.31	2.75	2.76	2.76	4.9	4.9	5.32
40517.33	0.66	0.7	0.7	3.78	3.78	4.26
40517.35	1.15	3.63	3.63	3.74	3.74	3.85
40517.38	2.81	3.75	3.75	2.57	2.57	2.47
40517.4	2.65	2.32	2.32	2.35	2.35	2.22
40517.42	1.29	1.29	1.29	1.09	1.09	1.29
40517.44	1.67	2.05	2.05	1.43	1.43	1.48
40517.46	4.81	4.61	4.61	3.19	3.19	3.09
40517.48	9.89	10.84	10.84	5.45	5.45	4.97
40517.5	2.95	2.9	2.9	1.5	1.5	1.36
40517.52	0.89	1.25	1.25	0.6	0.6	0.56
40517.54	0.12	0.33	0.33	0.9	0.9	1.03
40517.56	0.11	0.31	0.31	0.73	0.73	0.83
40517.58	0.14	1.71	1.71	1.12	1.12	1.01
40517.6	0.36	0.47	0.47	0.26	0.26	0.24
40517.63	0.18	0.17	0.17	0.16	0.16	0.15
40517.65	0.28	0.23	0.23	0.2	0.2	0.19
40517.67	0.46	1.45	1.45	0.73	0.73	0.66
40517.69	0.61	1	1	0.51	0.51	0.46
40517.71	1.68	1.16	1.16	0.94	0.94	0.84
40517.73	0.37	0.27	0.27	0.48	0.48	0.43
40517.75	0.31	0.59	0.59	0.74	0.74	0.67
40517.77	0.74	1.07	1.07	0.51	0.51	0.47
40517.79	0.83	1.27	1.27	0.94	0.94	0.98
40517.81	0.33	0.23	0.23	0.45	0.45	0.46
40517.83	1.05	1.41	1.41	0.86	0.86	0.78
40517.85	0.35	0.36	0.36	0.31	0.31	0.29
40517.88	0.19	0.09	0.09	0.09	0.09	0.09
40517.9	0.12	0.14	0.14	0.1	0.1	0.12
40517.92	0.09	0.09	0.09	0.27	0.27	0.38
40517.94	0.09	0.09	0.09	0.08	0.08	0.1
40517.96	0.15	0.09	0.09	0.14	0.14	0.15
40517.98	0.15	0.07	0.07	0.22	0.22	0.22
40518	0.07	0.08	0.08	0.37	0.37	0.35
40518.02	0.1	0.37	0.37	0.25	0.25	0.28

40518.04	0.18	0.38	0.38	0.31	0.31	0.32
40518.06	0.32	0.08	0.08	0.24	0.24	0.27
40518.08	0.06	0.22	0.22	0.53	0.53	0.53
40518.1	0	0.15	0.15	0.42	0.42	0.41
40518.13	0	0.23	0.23	0.3	0.3	0.28
40518.15	0.04	0.13	0.13	0.11	0.11	0.15
40518.17	0.05	0.1	0.1	0.18	0.18	0.33
40518.19	0.05	0.09	0.09	0.23	0.23	0.71
40518.21	0.01	0.13	0.13	0.28	0.28	0.51
40518.23	0.01	0.14	0.14	0.08	0.08	0.1
40518.25	0.09	0.18	0.18	0.08	0.08	0.08
40518.27	0.28	0.41	0.41	0.14	0.14	0.12
40518.29	0.06	0.09	0.09	0.07	0.07	0.07
40518.31	0.06	0.09	0.09	0.08	0.08	0.09
40518.33	0.73	0.95	0.95	0.4	0.4	0.38
40518.35	0.92	1.21	1.21	0.5	0.5	0.47
40518.38	0.69	0.78	0.78	0.42	0.42	0.47
40518.4	0.1	0.29	0.29	0.24	0.24	0.23
40518.42	0.2	0.82	0.82	0.49	0.49	0.46
40518.44	0.43	1	1	1.42	1.42	1.29
40518.46	1.66	1.94	1.94	1.02	1.02	0.93
40518.48	1.8	1.49	1.49	0.88	0.88	0.8
40518.5	1.24	0.93	0.93	0.75	0.75	0.7
40518.52	1.88	2.41	2.41	2.51	2.51	2.79
40518.54	1.16	1.5	1.5	1.62	1.62	1.87
40518.56	2.88	3.9	3.9	2.61	2.61	2.38
40518.58	1.35	1.64	1.64	0.98	0.98	0.89
40518.6	4.09	4.32	4.32	2.27	2.27	2.07
40518.63	2.13	0.83	0.83	1.09	1.09	1.03
40518.65	0.82	0.52	0.52	0.35	0.35	0.37
40518.67	1.47	1.52	1.52	0.68	0.68	0.68
40518.69	0.91	1.02	1.02	0.46	0.46	0.43
40518.71	0.29	0.49	0.49	0.22	0.22	0.22
40518.73	0.17	0.3	0.3	0.17	0.17	0.17
40518.75	0.15	0.27	0.27	0.17	0.17	0.15
40518.77	0.5	0.75	0.75	0.33	0.33	0.31
40518.79	0.41	0.16	0.16	0.33	0.33	0.34
40518.81	0.08	0.14	0.14	0.21	0.21	0.26
40518.83	0.47	0.44	0.44	0.74	0.74	0.82
40518.85	0.52	2.35	2.35	1.3	1.3	1.22
40518.88	0.66	1.8	1.8	1.76	1.76	1.63
40518.9	1.91	1.85	1.85	1.53	1.53	1.44
40518.92	3.36	4.21	4.21	1.95	1.95	1.86
40518.94	2.85	1.36	1.36	1.38	1.38	1.34
40518.96	0.48	0.5	0.5	0.34	0.34	0.33
40518.98	0.62	0.74	0.74	0.43	0.43	0.4
40519	1.39	1.58	1.58	0.72	0.72	0.65
40519.02	0.37	0.42	0.42	0.27	0.27	0.26
40519.04	0.36	0.46	0.46	1.16	1.16	1.27
40519.06	0.48	0.37	0.37	0.76	0.76	1.12
40519.08	1.37	2.94	2.94	1.67	1.67	1.57
40519.1	2.79	3.49	3.49	2.02	2.02	1.83
40519.13	2.15	1.74	1.74	1.06	1.06	0.95
40519.15	1.02	1.34	1.34	0.72	0.72	0.65
40519.17	0.77	0.69	0.69	0.67	0.67	0.64
40519.19	0.34	0.56	0.56	0.38	0.38	0.5

40519.21	0.41	1	1	0.45	0.45	0.53
40519.23	0.8	1.42	1.42	0.54	0.54	0.5
40519.25	0.33	0.55	0.55	0.29	0.29	0.28
40519.27	0.35	0.56	0.56	0.28	0.28	0.46
40519.29	0.2	0.25	0.25	0.16	0.16	0.56
40519.31	0.21	0.23	0.23	0.17	0.17	0.47
40519.33	0.32	0.39	0.39	0.32	0.32	0.37
40519.35	0.28	0.33	0.33	0.99	0.99	1.09
40519.38	1.74	3.66	3.66	1.63	1.63	1.52
40519.4	4.24	5.06	5.06	2.42	2.42	2.18
40519.42	3.45	1.83	1.83	1.78	1.78	1.61
40519.44	1.69	2.23	2.23	1.3	1.3	1.22
40519.46	0.77	0.93	0.93	0.83	0.83	0.82
40519.48	0.35	1.23	1.23	0.61	0.61	0.56
40519.5	0.11	0.74	0.74	0.42	0.42	0.39
40519.52	0.62	1.15	1.15	0.38	0.38	0.35
40519.54	0.11	0.32	0.32	0.14	0.14	0.21
40519.56	0.28	0.46	0.46	0.16	0.16	0.43
40519.58	0.82	0.46	0.46	0.35	0.35	0.39
40519.6	0.44	0.58	0.58	0.21	0.21	0.19
40519.63	0.19	0.2	0.2	0.1	0.1	0.09
40519.65	0.56	0.77	0.77	0.33	0.33	0.33
40519.67	0.48	0.64	0.64	0.64	0.64	0.69
40519.69	0.46	0.55	0.55	0.34	0.34	0.34
40519.71	0.61	0.83	0.83	0.78	0.78	0.78
40519.73	0.29	0.45	0.45	0.55	0.55	0.54
40519.75	1.08	4.15	4.15	2.22	2.22	1.99
40519.77	3.93	5.23	5.23	3.39	3.39	3.05
40519.79	2.16	2.89	2.89	2.92	2.92	2.74
40519.81	0.53	0.33	0.33	0.55	0.55	0.52
40519.83	1.09	1.48	1.48	0.61	0.61	0.57
40519.85	0.5	0.56	0.56	0.37	0.37	0.41
40519.88	0.56	0.63	0.63	1.05	1.05	1.18
40519.9	0.52	0.65	0.65	0.53	0.53	0.48
40519.92	1.77	1.87	1.87	1.06	1.06	1
40519.94	0.42	0.57	0.57	0.58	0.58	0.6
40519.96	0.8	0.96	0.96	0.81	0.81	0.82
40519.98	1.07	1.65	1.65	0.77	0.77	0.75
40520	0.66	0.96	0.96	0.59	0.59	0.58
40520.02	1.44	2.2	2.2	1.22	1.22	1.42
40520.04	0.71	0.98	0.98	0.85	0.85	1.05
40520.06	1.4	1.5	1.5	1.1	1.1	1.15
40520.08	2.61	3.57	3.57	1.6	1.6	1.46
40520.1	3.82	3.56	3.56	2.02	2.02	1.8
40520.13	0.43	0.28	0.28	0.21	0.21	0.18
40520.15	0.45	0.53	0.53	0.26	0.26	0.23
40520.17	0.16	0.17	0.17	0.09	0.09	0.08
40520.19	0.04	0.09	0.09	0.06	0.06	0.05
40520.21	0.08	0.12	0.12	0.1	0.1	0.09
40520.23	0.12	0.16	0.16	0.12	0.12	0.11
40520.25	0.73	1.01	1.01	0.4	0.4	0.36
40520.27	0.14	0.21	0.21	0.12	0.12	0.11
40520.29	0.26	0.32	0.32	0.19	0.19	0.17
40520.31	1.49	1.72	1.72	0.7	0.7	0.62
40520.33	0.91	1.15	1.15	0.68	0.68	0.6
40520.35	0.94	0.78	0.78	0.53	0.53	0.47

40520.38	0.86	1.14	1.14	0.47	0.47	0.42
40520.4	0.31	0.54	0.54	0.21	0.21	0.19
40520.42	0.33	0.57	0.57	0.22	0.22	0.19
40520.44	0.08	0.15	0.15	0.06	0.06	0.06
40520.46	0.09	0.14	0.14	0.06	0.06	0.05
40520.48	0.35	0.54	0.54	0.16	0.16	0.14
40520.5	0.24	0.37	0.37	0.11	0.11	0.1
40520.52	0.12	0.18	0.18	0.05	0.05	0.05
40520.54	0.01	0.01	0.01	0	0	0
40520.56	0	0	0	0	0	0
40520.58	0.09	0	0	0.03	0.03	0.03
40520.6	0.11	0	0	0.04	0.04	0.04
40520.63	0.41	0	0	0.15	0.15	0.13
40520.65	0.19	0	0	0.07	0.07	0.06
40520.67	0	0	0	0	0	0
40520.69	0	0	0	0	0	0
40520.71	0	0	0	0	0	0
40520.73	0	0	0	0	0	0
40520.75	0	0.01	0.01	0	0	0
40520.77	0.06	0.13	0.13	0.04	0.04	0.04
40520.79	0.12	0.2	0.2	0.12	0.12	0.12
40520.81	0.36	0.24	0.24	0.23	0.23	0.22
40520.83	0.72	0.88	0.88	0.55	0.55	0.51
40520.85	0.5	0.52	0.52	0.66	0.66	0.65
40520.88	0.69	0.03	0.03	0.72	0.72	0.64
40520.9	0.39	0.14	0.14	0.17	0.17	0.16
40520.92	0.11	0.16	0.16	0.08	0.08	0.08
40520.94	0.15	0.25	0.25	0.12	0.12	0.12
40520.96	0.08	0.19	0.19	0.14	0.14	0.13
40520.98	0.09	0.26	0.26	0.14	0.14	0.13
40521	0.52	0.77	0.77	0.44	0.44	0.46
40521.02	0.14	0.13	0.13	0.06	0.06	0.05
40521.04	0.05	0	0	0.02	0.02	0.02
40521.06	0.05	0	0	0.02	0.02	0.02
40521.08	0.01	0	0	0	0	0
40521.1	0	0	0	0	0	0
40521.13	0	0	0	0	0	0
40521.15	0.03	0.05	0.05	0.02	0.02	0.02
40521.17	0.39	0.09	0.09	0.18	0.18	0.17
40521.19	0.04	0.06	0.06	0.05	0.05	0.06
40521.21	0.03	0.04	0.04	0.04	0.04	0.05
40521.23	0.01	0.01	0.01	0.03	0.03	0.04
40521.25	0	0	0	0.01	0.01	0.01
40521.27	0	0	0	0	0	0
40521.29	0	0	0	0	0	0
40521.31	0	0	0	0	0	0
40521.33	0	0	0	0	0	0
40521.35	0	0	0	0	0	0
40521.38	0	0	0	0	0	0
40521.4	0	0	0	0	0	0
40521.42	0	0	0	0	0	0
40521.44	0	0	0	0	0	0
40521.46	0	0	0	0	0	0
40521.48	0	0	0	0	0	0
40521.5	0	0	0	0	0	0
40521.52	0	0	0	0	0	0

40521.54	0	0	0	0	0	0
40521.56	0	0	0	0	0	0
40521.58	0	0	0	0	0	0
40521.6	0	0	0	0	0	0
40521.63	0	0	0	0	0	0
40521.65	0	0	0	0	0	0
40521.67	0	0	0	0	0	0
40521.69	0	0	0	0	0	0
40521.71	0	0	0	0	0	0
40521.73	0	0	0	0	0	0
40521.75	0	0	0	0	0	0
40521.77	0.01	0.01	0.01	0	0	0
40521.79	0.01	0.02	0.02	0.01	0.01	0.01
40521.81	0.01	0.02	0.02	0.01	0.01	0.01
40521.83	0.01	0.02	0.02	0.01	0.01	0.01
40521.85	0.01	0.02	0.02	0	0	0
40521.88	0	0	0	0	0	0
40521.9	0	0.03	0.03	0	0	0
40521.92	0	0.03	0.03	0	0	0
40521.94	0	0.02	0.02	0	0	0
40521.96	0	0	0	0	0	0
40521.98	0	0	0	0	0	0
40522	0	0	0	0	0	0
40522.02	0	0	0	0	0	0
40522.04	0	0	0	0	0	0
40522.06	0	0	0	0	0	0
40522.08	0	0	0	0	0	0
40522.1	0	0	0	0	0	0
40522.13	0	0	0	0	0	0
40522.15	0.04	0.07	0.07	0.02	0.02	0.02
40522.17	0.05	0.09	0.09	0.02	0.02	0.02
40522.19	0.01	0.02	0.02	0.01	0.01	0
40522.21	0	0	0	0	0	0
40522.23	0	0	0	0	0	0
40522.25	0	0	0	0	0	0
40522.27	0	0	0	0	0	0
40522.29	0	0	0	0	0	0
40522.31	0	0	0	0	0	0
40522.33	0	0	0	0	0	0
40522.35	0	0	0	0	0	0
40522.38	0	0	0	0	0	0
40522.4	0	0	0	0	0	0
40522.42	0	0	0	0	0	0
40522.44	0	0	0	0	0	0
40522.46	0	0	0	0	0	0
40522.48	0	0	0	0	0	0
40522.5	0	0	0	0	0	0
40522.52	0	0	0	0	0	0
40522.54	0	0	0	0	0	0
40522.56	0	0	0	0	0	0
40522.58	0	0	0	0	0	0
40522.6	0	0	0	0	0	0
40522.63	0	0	0	0	0	0
40522.65	0	0	0	0	0	0
40522.67	0	0	0	0	0	0
40522.69	0	0	0	0	0	0

40522.71	0	0	0	0	0	0
40522.73	0	0	0	0	0	0
40522.75	0	0	0	0	0	0
40522.77	0	0	0	0	0	0
40522.79	0	0	0	0	0	0
40522.81	0	0	0	0	0	0
40522.83	0	0	0	0	0	0
40522.85	0	0	0	0	0	0
40522.88	0	0	0	0	0	0
40522.9	0	0	0	0	0	0
40522.92	0	0	0	0	0	0
40522.94	0	0	0	0	0	0
40522.96	0	0	0	0	0	0
40522.98	0	0	0	0	0	0
40523	0	0	0	0	0	0
40523.02	0	0	0	0	0	0
40523.04	0	0	0	0	0	0
40523.06	0	0	0	0	0	0
40523.08	0	0	0	0	0	0
40523.1	0	0	0	0	0	0
40523.13	0	0	0	0	0	0
40523.15	0	0	0	0	0	0
40523.17	0	0	0	0	0	0
40523.19	0	0	0	0	0	0
40523.21	0	0	0	0	0	0
40523.23	0	0	0	0	0	0
40523.25	0	0	0	0	0	0
40523.27	0	0	0	0	0	0
40523.29	0	0	0	0	0	0
40523.31	0	0	0	0	0	0
40523.33	0	0	0	0	0	0
40523.35	0	0	0	0	0	0
40523.38	0	0	0	0	0	0
40523.4	0	0	0	0	0	0
40523.42	0	0	0	0	0	0
40523.44	0	0	0	0	0	0
40523.46	0	0	0	0	0	0
40523.48	0	0	0	0	0	0
40523.5	0	0	0	0	0	0
40523.52	0	0	0	0	0	0
40523.54	0	0	0	0	0	0
40523.56	0	0	0	0	0	0
40523.58	0	0	0	0	0	0
40523.6	0	0	0	0	0	0
40523.63	0	0	0	0	0	0
40523.65	0	0	0	0	0	0
40523.67	0	0	0	0	0	0
40523.69	0	0	0	0	0	0
40523.71	0	0	0	0	0	0
40523.73	0	0	0	0	0	0
40523.75	0	0	0	0	0	0
40523.77	0	0	0	0	0	0
40523.79	0	0	0	0	0	0
40523.81	0	0	0	0	0	0
40523.83	0	0	0	0	0	0
40523.85	0	0	0	0	0	0

40523.88	0	0	0	0	0	0
40523.9	0	0	0	0	0	0
40523.92	0	0	0	0	0	0
40523.94	0	0	0	0	0	0
40523.96	0	0	0	0	0	0
40523.98	0	0	0	0	0	0
40524	0	0	0	0	0	0
40524.02	0	0	0	0	0	0
40524.04	0	0	0	0	0	0
40524.06	0	0	0	0	0	0
40524.08	0	0	0	0	0	0
40524.1	0	0	0	0	0	0
40524.13	0	0	0	0	0	0
40524.15	0	0	0	0	0	0
40524.17	0	0	0	0	0	0
40524.19	0	0	0	0	0	0
40524.21	0	0	0	0	0	0
40524.23	0	0	0	0	0	0
40524.25	0	0	0	0	0	0
40524.27	0	0	0	0	0	0
40524.29	0	0	0	0	0	0
40524.31	0	0	0	0	0	0
40524.33	0	0	0	0	0	0
40524.35	0	0	0	0	0	0
40524.38	0	0	0	0	0	0
40524.4	0	0	0	0	0	0
40524.42	0	0	0	0	0	0
40524.44	0	0	0	0	0	0
40524.46	0	0	0	0	0	0
40524.48	0	0	0	0	0	0
40524.5	0	0	0	0	0	0
40524.52	0	0	0	0	0	0
40524.54	0	0	0	0	0	0
40524.56	0	0	0	0	0	0
40524.58	0	0	0	0	0	0
40524.6	0	0	0	0	0	0
40524.63	0	0	0	0	0	0
40524.65	0	0	0	0	0	0
40524.67	0	0	0	0	0	0
40524.69	0	0	0	0	0	0
40524.71	0	0	0	0	0	0
40524.73	0	0	0	0	0	0
40524.75	0	0	0	0	0	0
40524.77	0	0	0	0	0	0
40524.79	0	0	0	0	0	0
40524.81	0	0	0	0	0	0
40524.83	0	0	0	0	0	0
40524.85	0	0	0	0	0	0
40524.88	0	0	0	0	0	0
40524.9	0	0	0	0	0	0
40524.92	0	0	0	0	0	0
40524.94	0	0	0	0	0	0
40524.96	0	0	0	0	0	0
40524.98	0	0	0	0	0	0
40525	0	0	0	0	0	0
40525.02	0	0	0	0	0	0

40525.04	0	0	0	0	0	0
40525.06	0	0	0	0	0	0
40525.08	0	0	0	0	0	0
40525.1	0	0	0	0	0	0
40525.13	0	0	0	0	0	0
40525.15	0	0	0	0	0	0
40525.17	0	0	0	0	0	0
40525.19	0	0	0	0	0	0
40525.21	0	0	0	0	0	0
40525.23	0	0	0	0	0	0
40525.25	0	0	0	0	0	0
40525.27	0	0	0	0	0	0
40525.29	0	0	0	0	0	0
40525.31	0	0	0	0	0	0
40525.33	0	0	0	0	0	0
40525.35	0	0	0	0	0	0
40525.38	0	0	0	0	0	0
40525.4	0	0	0	0	0	0
40525.42	0	0	0	0	0	0
40525.44	0	0	0	0	0	0
40525.46	0	0	0	0	0	0
40525.48	0	0	0	0	0	0
40525.5	0	0	0	0	0	0
40525.52	0	0	0	0	0	0
40525.54	0	0	0	0	0	0
Effect. Rai	NUMINBAI	LND_INFL(	L_NERANG	HD_INFLO'	HINZE_DA	CLEARVIEW
40513.4	0	0	0	0	0	0
40513.42	0.01	0.01	0.01	0	0	0
40513.44	0.01	0	0	0	0	0
40513.46	0	0.01	0.01	0	0	0
40513.48	0	0	0	0	0	0
40513.5	0	0	0	0	0	0
40513.52	0	0	0	0	0	0
40513.54	0	0	0	0.01	0.01	0.01
40513.56	0.01	0.02	0.02	0.02	0.02	0.01
40513.58	0.01	0.01	0.01	0.02	0.02	0.02
40513.6	0	0.01	0.01	0.01	0.01	0.01
40513.63	0.01	0.01	0.01	0.04	0.04	0.03
40513.65	0.11	0.02	0.02	0.11	0.11	0.1
40513.67	0.5	0.27	0.27	0.47	0.47	0.42
40513.69	2.99	1.04	1.04	1.87	1.87	1.67
40513.71	1.3	0.62	0.62	1.14	1.14	1.02
40513.73	1.77	0.46	0.46	1.09	1.09	0.97
40513.75	2.26	1.22	1.22	1.35	1.35	1.21
40513.77	0.31	0.1	0.1	0.58	0.58	0.53
40513.79	0.64	0.41	0.41	0.31	0.31	0.28
40513.81	0.21	0.32	0.32	0.49	0.49	0.44
40513.83	0.45	0.61	0.61	0.4	0.4	0.36
40513.85	0.03	0.07	0.07	0.04	0.04	0.03
40513.88	0.03	0.07	0.07	0.03	0.03	0.03
40513.9	0.04	0.19	0.19	0.04	0.04	0.04
40513.92	1.39	1.59	1.59	0.62	0.62	0.56
40513.94	0.92	1.42	1.42	0.42	0.42	0.38
40513.96	0.27	0.4	0.4	0.13	0.13	0.11
40513.98	0.73	1.07	1.07	0.34	0.34	0.3
40514	0.06	0.09	0.09	0.03	0.03	0.02

40514.02	0	0	0	0	0	0
40514.04	0	0	0	0	0	0
40514.06	0	0.01	0.01	0	0	0
40514.08	0.01	0.02	0.02	0.01	0.01	0.01
40514.1	0.01	0.02	0.02	0.01	0.01	0.01
40514.13	0.01	0.15	0.15	0.03	0.03	0.03
40514.15	0.79	1.09	1.09	0.36	0.36	0.32
40514.17	0.12	0.18	0.18	0.06	0.06	0.05
40514.19	0.01	0.02	0.02	0.02	0.02	0.02
40514.21	0.05	0.08	0.08	0.05	0.05	0.04
40514.23	0.06	0.06	0.06	0.04	0.04	0.04
40514.25	0.04	0.02	0.02	0.03	0.03	0.02
40514.27	0.02	0.02	0.02	0.02	0.02	0.02
40514.29	0.01	0.02	0.02	0.04	0.04	0.03
40514.31	0.04	0.09	0.09	0.02	0.02	0.02
40514.33	0	0	0	0	0	0
40514.35	0	0	0	0	0	0
40514.38	0	0	0	0	0	0
40514.4	0	0	0	0	0	0
40514.42	0	0	0	0.01	0.01	0.01
40514.44	0	0	0	0.01	0.01	0.01
40514.46	0	0	0	0.01	0.01	0.01
40514.48	0	0	0	0.01	0.01	0.01
40514.5	0	0	0	0.01	0.01	0.01
40514.52	0	0	0	0	0	0
40514.54	0.01	0.01	0.01	0.02	0.02	0.02
40514.56	0.5	0.82	0.82	0.25	0.25	0.23
40514.58	0.4	0.58	0.58	0.21	0.21	0.19
40514.6	0.29	0.39	0.39	0.16	0.16	0.15
40514.63	0.5	0.61	0.61	0.28	0.28	0.26
40514.65	0.12	0.05	0.05	0.05	0.05	0.05
40514.67	0.02	0.03	0.03	0.04	0.04	0.05
40514.69	0.02	0.03	0.03	0.06	0.06	0.06
40514.71	0.11	0.11	0.11	0.18	0.18	0.16
40514.73	0.06	0.13	0.13	0.08	0.08	0.07
40514.75	0.47	0.72	0.72	0.25	0.25	0.22
40514.77	0.59	0.52	0.52	0.28	0.28	0.25
40514.79	0.16	0.05	0.05	0.08	0.08	0.07
40514.81	0.13	0.45	0.45	0.57	0.57	0.51
40514.83	0.48	0.1	0.1	0.35	0.35	0.31
40514.85	0.15	0.04	0.04	0.1	0.1	0.09
40514.88	0.02	0.06	0.06	0.45	0.45	0.55
40514.9	0.03	0.05	0.05	0.56	0.56	0.72
40514.92	0	0.01	0.01	0	0	0
40514.94	0.02	0.1	0.1	0.05	0.05	0.04
40514.96	0.14	0.37	0.37	0.19	0.19	0.17
40514.98	0.36	0.54	0.54	0.17	0.17	0.15
40515	0.06	0.09	0.09	0.03	0.03	0.03
40515.02	0.03	0.03	0.03	0.02	0.02	0.02
40515.04	0.03	0.03	0.03	0.02	0.02	0.02
40515.06	0.01	0.01	0.01	0.01	0.01	0.01
40515.08	0	0.01	0.01	0.01	0.01	0.01
40515.1	0	0.01	0.01	0.01	0.01	0.01
40515.13	0	0.01	0.01	0	0	0
40515.15	0.02	0.04	0.04	0.01	0.01	0.01
40515.17	0	0.01	0.01	0	0	0

40515.19	0.01	0.02	0.02	0	0	0
40515.21	0.09	0.04	0.04	0.04	0.04	0.03
40515.23	0.03	0.03	0.03	0.02	0.02	0.02
40515.25	0.01	0.03	0.03	0.01	0.01	0.01
40515.27	0.08	0.15	0.15	0.05	0.05	0.05
40515.29	0.01	0.02	0.02	0.07	0.07	0.08
40515.31	0.01	0.02	0.02	0.15	0.15	0.13
40515.33	0.03	0.03	0.03	0.05	0.05	0.05
40515.35	0.03	0.04	0.04	0.13	0.13	0.12
40515.38	0.04	0.39	0.39	0.2	0.2	0.18
40515.4	1.94	1.71	1.71	0.83	0.83	0.74
40515.42	0.08	0.04	0.04	0.06	0.06	0.06
40515.44	0.3	0.38	0.38	0.19	0.19	0.18
40515.46	0.37	0.07	0.07	0.24	0.24	0.23
40515.48	0.1	0.07	0.07	0.17	0.17	0.19
40515.5	0.62	0.96	0.96	0.51	0.51	0.47
40515.52	0.32	0.51	0.51	0.69	0.69	0.72
40515.54	0.09	0.16	0.16	0.06	0.06	0.05
40515.56	0.04	0.07	0.07	0.04	0.04	0.04
40515.58	0.13	0.18	0.18	0.09	0.09	0.09
40515.6	0.47	0.58	0.58	0.25	0.25	0.22
40515.63	0.85	1.09	1.09	0.81	0.81	0.76
40515.65	0.58	0.9	0.9	1.08	1.08	1.2
40515.67	0.38	0.9	0.9	0.67	0.67	0.6
40515.69	0.4	0.47	0.47	0.2	0.2	0.18
40515.71	0.53	0.73	0.73	0.36	0.36	0.33
40515.73	0.11	0.12	0.12	0.08	0.08	0.08
40515.75	0.04	0.03	0.03	0.06	0.06	0.06
40515.77	0.04	0.03	0.03	0.18	0.18	0.21
40515.79	0.14	0.02	0.02	0.07	0.07	0.07
40515.81	0.03	0.01	0.01	0.03	0.03	0.03
40515.83	0	0.07	0.07	0.06	0.06	0.05
40515.85	0	0.03	0.03	0.02	0.02	0.01
40515.88	0	0	0	0	0	0
40515.9	0	0.01	0.01	0	0	0
40515.92	0.01	0.02	0.02	0.01	0.01	0.01
40515.94	0.05	0.08	0.08	0.03	0.03	0.03
40515.96	0.06	0.04	0.04	0.04	0.04	0.03
40515.98	0.06	0.03	0.03	0.04	0.04	0.03
40516	0.05	0.08	0.08	0.04	0.04	0.04
40516.02	1.19	1.65	1.65	0.56	0.56	0.5
40516.04	0.06	0.04	0.04	0.06	0.06	0.06
40516.06	0.43	0.11	0.11	0.4	0.4	0.36
40516.08	2.34	2.75	2.75	1.17	1.17	1.05
40516.1	0.47	0.51	0.51	0.27	0.27	0.25
40516.13	0.07	0.06	0.06	0.09	0.09	0.09
40516.15	0.03	0.05	0.05	0.06	0.06	0.06
40516.17	0.08	0.03	0.03	0.07	0.07	0.07
40516.19	0.92	0.1	0.1	0.59	0.59	0.53
40516.21	0.52	0.49	0.49	0.25	0.25	0.22
40516.23	0.05	0.04	0.04	0.04	0.04	0.03
40516.25	0.05	0.04	0.04	0.04	0.04	0.03
40516.27	0.05	0.05	0.05	0.04	0.04	0.04
40516.29	0.04	0.03	0.03	0.05	0.05	0.05
40516.31	0.11	0.11	0.11	0.2	0.2	0.19
40516.33	0.09	0.1	0.1	0.1	0.1	0.09

40516.35	0.09	0.1	0.1	0.12	0.12	0.11
40516.38	0.92	0.72	0.72	0.94	0.94	0.85
40516.4	1.51	1.05	1.05	0.73	0.73	0.66
40516.42	1.74	2.31	2.31	2.57	2.57	2.46
40516.44	5.12	7.05	7.05	4.71	4.71	4.47
40516.46	4.19	3.12	3.12	2.62	2.62	2.52
40516.48	1.7	1.79	1.79	1.2	1.2	1.11
40516.5	1	0.77	0.77	0.57	0.57	0.52
40516.52	3.99	3.4	3.4	2.2	2.2	1.98
40516.54	4.49	3.39	3.39	2.46	2.46	2.39
40516.56	2.24	3.18	3.18	2.7	2.7	2.75
40516.58	2.64	2.43	2.43	2.59	2.59	2.53
40516.6	1.51	1.03	1.03	1.15	1.15	1.06
40516.63	0.9	0.75	0.75	0.44	0.44	0.39
40516.65	0.88	1.05	1.05	0.73	0.73	0.65
40516.67	0.94	0.34	0.34	0.42	0.42	0.38
40516.69	0.23	0.41	0.41	0.39	0.39	0.35
40516.71	1.95	1.59	1.59	1.1	1.1	0.98
40516.73	0.71	0.72	0.72	0.34	0.34	0.3
40516.75	0.14	0.15	0.15	0.12	0.12	0.11
40516.77	0.71	0.98	0.98	0.47	0.47	0.42
40516.79	0.59	0.53	0.53	0.25	0.25	0.22
40516.81	0	0	0	0	0	0
40516.83	0	0	0	0	0	0
40516.85	0	0	0	0	0	0
40516.88	0	0	0	0	0	0
40516.9	0.02	0.04	0.04	0.01	0.01	0.01
40516.92	0.03	0.05	0.05	0.04	0.04	0.04
40516.94	0.03	0.02	0.02	0.04	0.04	0.04
40516.96	0.07	0.09	0.09	0.08	0.08	0.08
40516.98	0.06	0.07	0.07	0.09	0.09	0.09
40517	0.07	0.08	0.08	0.14	0.14	0.15
40517.02	0.22	0.37	0.37	0.24	0.24	0.22
40517.04	0.54	0.51	0.51	0.27	0.27	0.24
40517.06	0.06	0.05	0.05	0.05	0.05	0.05
40517.08	0.13	0.16	0.16	0.1	0.1	0.1
40517.1	0.11	0.11	0.11	0.11	0.11	0.11
40517.13	0.06	0.06	0.06	0.32	0.32	0.49
40517.15	0.25	0.71	0.71	1.28	1.28	1.63
40517.17	0.74	1.73	1.73	1.7	1.7	1.68
40517.19	1.27	2.47	2.47	1.4	1.4	1.31
40517.21	7.1	9.23	9.23	5.41	5.41	5.11
40517.23	5.79	5.84	5.84	3.21	3.21	3.22
40517.25	0.72	1.15	1.15	2.38	2.38	3.1
40517.27	0.34	3.98	3.98	4.62	4.62	4.5
40517.29	2.97	6.12	6.12	5.05	5.05	4.9
40517.31	2.49	2.51	2.51	4.64	4.64	5.04
40517.33	0.46	0.52	0.52	3.55	3.55	4.01
40517.35	0.9	3.39	3.39	3.48	3.48	3.58
40517.38	2.55	3.5	3.5	2.32	2.32	2.21
40517.4	2.4	2.08	2.08	2.1	2.1	1.96
40517.42	1.04	1.05	1.05	0.84	0.84	1.03
40517.44	1.43	1.81	1.81	1.19	1.19	1.23
40517.46	4.56	4.37	4.37	2.94	2.94	2.84
40517.48	9.64	10.61	10.61	5.2	5.2	4.72
40517.5	2.71	2.67	2.67	1.31	1.31	1.18

40517.52	0.72	1.03	1.03	0.43	0.43	0.4
40517.54	0.07	0.21	0.21	0.76	0.76	0.87
40517.56	0.06	0.18	0.18	0.62	0.62	0.7
40517.58	0.08	1.6	1.6	1.03	1.03	0.92
40517.6	0.23	0.31	0.31	0.16	0.16	0.15
40517.63	0.11	0.09	0.09	0.09	0.09	0.08
40517.65	0.2	0.13	0.13	0.12	0.12	0.11
40517.67	0.34	1.23	1.23	0.61	0.61	0.55
40517.69	0.43	0.79	0.79	0.37	0.37	0.33
40517.71	1.46	0.96	0.96	0.79	0.79	0.71
40517.73	0.23	0.17	0.17	0.34	0.34	0.3
40517.75	0.18	0.47	0.47	0.6	0.6	0.53
40517.77	0.6	0.89	0.89	0.38	0.38	0.34
40517.79	0.69	1.09	1.09	0.78	0.78	0.8
40517.81	0.23	0.14	0.14	0.31	0.31	0.31
40517.83	0.84	1.23	1.23	0.68	0.68	0.61
40517.85	0.24	0.24	0.24	0.2	0.2	0.18
40517.88	0.12	0.06	0.06	0.06	0.06	0.05
40517.9	0.07	0.08	0.08	0.06	0.06	0.07
40517.92	0.05	0.06	0.06	0.23	0.23	0.32
40517.94	0.05	0.06	0.06	0.05	0.05	0.05
40517.96	0.09	0.05	0.05	0.08	0.08	0.08
40517.98	0.09	0.04	0.04	0.13	0.13	0.13
40518	0.04	0.05	0.05	0.29	0.29	0.27
40518.02	0.06	0.27	0.27	0.15	0.15	0.17
40518.04	0.1	0.27	0.27	0.2	0.2	0.2
40518.06	0.24	0.05	0.05	0.16	0.16	0.17
40518.08	0.04	0.13	0.13	0.46	0.46	0.45
40518.1	0	0.09	0.09	0.34	0.34	0.33
40518.13	0	0.18	0.18	0.2	0.2	0.19
40518.15	0.02	0.09	0.09	0.07	0.07	0.1
40518.17	0.03	0.06	0.06	0.13	0.13	0.26
40518.19	0.03	0.06	0.06	0.18	0.18	0.64
40518.21	0.01	0.08	0.08	0.21	0.21	0.42
40518.23	0.01	0.09	0.09	0.05	0.05	0.05
40518.25	0.05	0.11	0.11	0.05	0.05	0.05
40518.27	0.19	0.3	0.3	0.1	0.1	0.09
40518.29	0.04	0.06	0.06	0.04	0.04	0.05
40518.31	0.04	0.06	0.06	0.05	0.05	0.05
40518.33	0.59	0.81	0.81	0.31	0.31	0.29
40518.35	0.78	1.07	1.07	0.41	0.41	0.37
40518.38	0.55	0.63	0.63	0.31	0.31	0.36
40518.4	0.07	0.22	0.22	0.17	0.17	0.16
40518.42	0.15	0.71	0.71	0.39	0.39	0.36
40518.44	0.33	0.9	0.9	1.28	1.28	1.15
40518.46	1.46	1.79	1.79	0.86	0.86	0.78
40518.48	1.61	1.36	1.36	0.75	0.75	0.68
40518.5	1.05	0.79	0.79	0.6	0.6	0.55
40518.52	1.69	2.26	2.26	2.35	2.35	2.62
40518.54	0.97	1.34	1.34	1.44	1.44	1.68
40518.56	2.7	3.74	3.74	2.46	2.46	2.24
40518.58	1.17	1.48	1.48	0.84	0.84	0.75
40518.6	3.92	4.17	4.17	2.12	2.12	1.94
40518.63	1.95	0.68	0.68	0.96	0.96	0.89
40518.65	0.65	0.41	0.41	0.27	0.27	0.29
40518.67	1.3	1.41	1.41	0.6	0.6	0.58

40518.69	0.78	0.93	0.93	0.39	0.39	0.35
40518.71	0.25	0.44	0.44	0.18	0.18	0.17
40518.73	0.12	0.22	0.22	0.12	0.12	0.11
40518.75	0.1	0.19	0.19	0.11	0.11	0.1
40518.77	0.43	0.66	0.66	0.27	0.27	0.24
40518.79	0.33	0.12	0.12	0.25	0.25	0.25
40518.81	0.06	0.1	0.1	0.16	0.16	0.19
40518.83	0.4	0.34	0.34	0.63	0.63	0.7
40518.85	0.43	2.21	2.21	1.17	1.17	1.08
40518.88	0.51	1.66	1.66	1.61	1.61	1.47
40518.9	1.76	1.72	1.72	1.38	1.38	1.28
40518.92	3.21	4.12	4.12	1.83	1.83	1.73
40518.94	2.69	1.27	1.27	1.27	1.27	1.22
40518.96	0.38	0.44	0.44	0.26	0.26	0.24
40518.98	0.49	0.63	0.63	0.33	0.33	0.3
40519	1.26	1.48	1.48	0.63	0.63	0.57
40519.02	0.31	0.37	0.37	0.21	0.21	0.2
40519.04	0.29	0.38	0.38	1.07	1.07	1.17
40519.06	0.38	0.31	0.31	0.68	0.68	1.02
40519.08	1.23	2.82	2.82	1.53	1.53	1.42
40519.1	2.65	3.39	3.39	1.9	1.9	1.71
40519.13	2.01	1.63	1.63	0.96	0.96	0.86
40519.15	0.88	1.23	1.23	0.61	0.61	0.54
40519.17	0.67	0.6	0.6	0.54	0.54	0.51
40519.19	0.29	0.5	0.5	0.3	0.3	0.42
40519.21	0.34	0.9	0.9	0.39	0.39	0.47
40519.23	0.74	1.32	1.32	0.48	0.48	0.44
40519.25	0.27	0.46	0.46	0.22	0.22	0.21
40519.27	0.29	0.48	0.48	0.22	0.22	0.4
40519.29	0.16	0.21	0.21	0.12	0.12	0.52
40519.31	0.16	0.21	0.21	0.14	0.14	0.42
40519.33	0.25	0.33	0.33	0.25	0.25	0.29
40519.35	0.22	0.28	0.28	0.91	0.91	0.99
40519.38	1.65	3.57	3.57	1.53	1.53	1.42
40519.4	4.12	4.97	4.97	2.31	2.31	2.08
40519.42	3.34	1.75	1.75	1.66	1.66	1.5
40519.44	1.58	2.15	2.15	1.19	1.19	1.1
40519.46	0.67	0.85	0.85	0.74	0.74	0.72
40519.48	0.31	1.16	1.16	0.56	0.56	0.5
40519.5	0.09	0.68	0.68	0.37	0.37	0.34
40519.52	0.58	1.08	1.08	0.35	0.35	0.32
40519.54	0.1	0.28	0.28	0.12	0.12	0.18
40519.56	0.24	0.41	0.41	0.14	0.14	0.4
40519.58	0.78	0.44	0.44	0.32	0.32	0.36
40519.6	0.41	0.56	0.56	0.19	0.19	0.17
40519.63	0.17	0.19	0.19	0.09	0.09	0.08
40519.65	0.52	0.73	0.73	0.3	0.3	0.29
40519.67	0.43	0.6	0.6	0.6	0.6	0.64
40519.69	0.41	0.52	0.52	0.29	0.29	0.28
40519.71	0.54	0.78	0.78	0.71	0.71	0.7
40519.73	0.24	0.41	0.41	0.48	0.48	0.46
40519.75	1.01	4.09	4.09	2.15	2.15	1.92
40519.77	3.85	5.17	5.17	3.29	3.29	2.96
40519.79	2.07	2.84	2.84	2.82	2.82	2.64
40519.81	0.47	0.31	0.31	0.47	0.47	0.44
40519.83	1.03	1.44	1.44	0.56	0.56	0.52

40519.85	0.44	0.52	0.52	0.31	0.31	0.34
40519.88	0.5	0.59	0.59	0.98	0.98	1.09
40519.9	0.47	0.61	0.61	0.47	0.47	0.43
40519.92	1.74	1.83	1.83	1	1	0.93
40519.94	0.37	0.53	0.53	0.52	0.52	0.53
40519.96	0.74	0.92	0.92	0.74	0.74	0.74
40519.98	1.04	1.61	1.61	0.72	0.72	0.68
40520	0.63	0.93	0.93	0.54	0.54	0.52
40520.02	1.42	2.16	2.16	1.18	1.18	1.36
40520.04	0.67	0.95	0.95	0.8	0.8	0.99
40520.06	1.35	1.48	1.48	1.05	1.05	1.09
40520.08	2.55	3.55	3.55	1.54	1.54	1.39
40520.1	3.77	3.54	3.54	1.96	1.96	1.75
40520.13	0.39	0.28	0.28	0.18	0.18	0.16
40520.15	0.43	0.52	0.52	0.24	0.24	0.22
40520.17	0.15	0.16	0.16	0.08	0.08	0.08
40520.19	0.04	0.08	0.08	0.05	0.05	0.05
40520.21	0.08	0.12	0.12	0.09	0.09	0.08
40520.23	0.12	0.15	0.15	0.11	0.11	0.1
40520.25	0.72	1	1	0.38	0.38	0.34
40520.27	0.14	0.2	0.2	0.11	0.11	0.1
40520.29	0.24	0.31	0.31	0.18	0.18	0.16
40520.31	1.44	1.71	1.71	0.67	0.67	0.6
40520.33	0.86	1.13	1.13	0.64	0.64	0.57
40520.35	0.89	0.76	0.76	0.49	0.49	0.44
40520.38	0.85	1.12	1.12	0.45	0.45	0.4
40520.4	0.3	0.53	0.53	0.2	0.2	0.18
40520.42	0.32	0.56	0.56	0.21	0.21	0.18
40520.44	0.08	0.15	0.15	0.06	0.06	0.05
40520.46	0.09	0.14	0.14	0.06	0.06	0.05
40520.48	0.35	0.54	0.54	0.16	0.16	0.14
40520.5	0.24	0.37	0.37	0.11	0.11	0.1
40520.52	0.12	0.18	0.18	0.05	0.05	0.05
40520.54	0.01	0.01	0.01	0	0	0
40520.56	0	0	0	0	0	0
40520.58	0.09	0	0	0.03	0.03	0.03
40520.6	0.11	0	0	0.04	0.04	0.04
40520.63	0.4	0	0	0.15	0.15	0.13
40520.65	0.19	0	0	0.07	0.07	0.06
40520.67	0	0	0	0	0	0
40520.69	0	0	0	0	0	0
40520.71	0	0	0	0	0	0
40520.73	0	0	0	0	0	0
40520.75	0	0	0	0	0	0
40520.77	0.06	0.13	0.13	0.04	0.04	0.04
40520.79	0.12	0.19	0.19	0.11	0.11	0.11
40520.81	0.33	0.24	0.24	0.2	0.2	0.19
40520.83	0.69	0.87	0.87	0.52	0.52	0.48
40520.85	0.47	0.51	0.51	0.62	0.62	0.61
40520.88	0.66	0.03	0.03	0.69	0.69	0.61
40520.9	0.36	0.14	0.14	0.16	0.16	0.14
40520.92	0.11	0.16	0.16	0.07	0.07	0.08
40520.94	0.15	0.25	0.25	0.11	0.11	0.11
40520.96	0.08	0.18	0.18	0.13	0.13	0.12
40520.98	0.09	0.25	0.25	0.13	0.13	0.12
40521	0.52	0.76	0.76	0.43	0.43	0.44

40521.02	0.14	0.13	0.13	0.06	0.06	0.05
40521.04	0.05	0	0	0.02	0.02	0.01
40521.06	0.05	0	0	0.02	0.02	0.01
40521.08	0.01	0	0	0	0	0
40521.1	0	0	0	0	0	0
40521.13	0	0	0	0	0	0
40521.15	0.03	0.05	0.05	0.02	0.02	0.02
40521.17	0.36	0.09	0.09	0.16	0.16	0.16
40521.19	0.04	0.06	0.06	0.04	0.04	0.05
40521.21	0.03	0.04	0.04	0.04	0.04	0.05
40521.23	0.01	0.01	0.01	0.03	0.03	0.04
40521.25	0	0	0	0	0	0.01
40521.27	0	0	0	0	0	0
40521.29	0	0	0	0	0	0
40521.31	0	0	0	0	0	0
40521.33	0	0	0	0	0	0
40521.35	0	0	0	0	0	0
40521.38	0	0	0	0	0	0
40521.4	0	0	0	0	0	0
40521.42	0	0	0	0	0	0
40521.44	0	0	0	0	0	0
40521.46	0	0	0	0	0	0
40521.48	0	0	0	0	0	0
40521.5	0	0	0	0	0	0
40521.52	0	0	0	0	0	0
40521.54	0	0	0	0	0	0
40521.56	0	0	0	0	0	0
40521.58	0	0	0	0	0	0
40521.6	0	0	0	0	0	0
40521.63	0	0	0	0	0	0
40521.65	0	0	0	0	0	0
40521.67	0	0	0	0	0	0
40521.69	0	0	0	0	0	0
40521.71	0	0	0	0	0	0
40521.73	0	0	0	0	0	0
40521.75	0	0	0	0	0	0
40521.77	0.01	0.01	0.01	0	0	0
40521.79	0.01	0.02	0.02	0.01	0.01	0.01
40521.81	0.01	0.02	0.02	0.01	0.01	0.01
40521.83	0.01	0.02	0.02	0.01	0.01	0.01
40521.85	0.01	0.02	0.02	0	0	0
40521.88	0	0	0	0	0	0
40521.9	0	0.02	0.02	0	0	0
40521.92	0	0.02	0.02	0	0	0
40521.94	0	0.02	0.02	0	0	0
40521.96	0	0	0	0	0	0
40521.98	0	0	0	0	0	0
40522	0	0	0	0	0	0
40522.02	0	0	0	0	0	0
40522.04	0	0	0	0	0	0
40522.06	0	0	0	0	0	0
40522.08	0	0	0	0	0	0
40522.1	0	0	0	0	0	0
40522.13	0	0	0	0	0	0
40522.15	0.04	0.07	0.07	0.02	0.02	0.02
40522.17	0.05	0.09	0.09	0.02	0.02	0.02

40522.19	0.01	0.02	0.02	0.01	0.01	0
40522.21	0	0	0	0	0	0
40522.23	0	0	0	0	0	0
40522.25	0	0	0	0	0	0
40522.27	0	0	0	0	0	0
40522.29	0	0	0	0	0	0
40522.31	0	0	0	0	0	0
40522.33	0	0	0	0	0	0
40522.35	0	0	0	0	0	0
40522.38	0	0	0	0	0	0
40522.4	0	0	0	0	0	0
40522.42	0	0	0	0	0	0
40522.44	0	0	0	0	0	0
40522.46	0	0	0	0	0	0
40522.48	0	0	0	0	0	0
40522.5	0	0	0	0	0	0
40522.52	0	0	0	0	0	0
40522.54	0	0	0	0	0	0
40522.56	0	0	0	0	0	0
40522.58	0	0	0	0	0	0
40522.6	0	0	0	0	0	0
40522.63	0	0	0	0	0	0
40522.65	0	0	0	0	0	0
40522.67	0	0	0	0	0	0
40522.69	0	0	0	0	0	0
40522.71	0	0	0	0	0	0
40522.73	0	0	0	0	0	0
40522.75	0	0	0	0	0	0
40522.77	0	0	0	0	0	0
40522.79	0	0	0	0	0	0
40522.81	0	0	0	0	0	0
40522.83	0	0	0	0	0	0
40522.85	0	0	0	0	0	0
40522.88	0	0	0	0	0	0
40522.9	0	0	0	0	0	0
40522.92	0	0	0	0	0	0
40522.94	0	0	0	0	0	0
40522.96	0	0	0	0	0	0
40522.98	0	0	0	0	0	0
40523	0	0	0	0	0	0
40523.02	0	0	0	0	0	0
40523.04	0	0	0	0	0	0
40523.06	0	0	0	0	0	0
40523.08	0	0	0	0	0	0
40523.1	0	0	0	0	0	0
40523.13	0	0	0	0	0	0
40523.15	0	0	0	0	0	0
40523.17	0	0	0	0	0	0
40523.19	0	0	0	0	0	0
40523.21	0	0	0	0	0	0
40523.23	0	0	0	0	0	0
40523.25	0	0	0	0	0	0
40523.27	0	0	0	0	0	0
40523.29	0	0	0	0	0	0
40523.31	0	0	0	0	0	0
40523.33	0	0	0	0	0	0

40523.35	0	0	0	0	0	0
40523.38	0	0	0	0	0	0
40523.4	0	0	0	0	0	0
40523.42	0	0	0	0	0	0
40523.44	0	0	0	0	0	0
40523.46	0	0	0	0	0	0
40523.48	0	0	0	0	0	0
40523.5	0	0	0	0	0	0
40523.52	0	0	0	0	0	0
40523.54	0	0	0	0	0	0
40523.56	0	0	0	0	0	0
40523.58	0	0	0	0	0	0
40523.6	0	0	0	0	0	0
40523.63	0	0	0	0	0	0
40523.65	0	0	0	0	0	0
40523.67	0	0	0	0	0	0
40523.69	0	0	0	0	0	0
40523.71	0	0	0	0	0	0
40523.73	0	0	0	0	0	0
40523.75	0	0	0	0	0	0
40523.77	0	0	0	0	0	0
40523.79	0	0	0	0	0	0
40523.81	0	0	0	0	0	0
40523.83	0	0	0	0	0	0
40523.85	0	0	0	0	0	0
40523.88	0	0	0	0	0	0
40523.9	0	0	0	0	0	0
40523.92	0	0	0	0	0	0
40523.94	0	0	0	0	0	0
40523.96	0	0	0	0	0	0
40523.98	0	0	0	0	0	0
40524	0	0	0	0	0	0
40524.02	0	0	0	0	0	0
40524.04	0	0	0	0	0	0
40524.06	0	0	0	0	0	0
40524.08	0	0	0	0	0	0
40524.1	0	0	0	0	0	0
40524.13	0	0	0	0	0	0
40524.15	0	0	0	0	0	0
40524.17	0	0	0	0	0	0
40524.19	0	0	0	0	0	0
40524.21	0	0	0	0	0	0
40524.23	0	0	0	0	0	0
40524.25	0	0	0	0	0	0
40524.27	0	0	0	0	0	0
40524.29	0	0	0	0	0	0
40524.31	0	0	0	0	0	0
40524.33	0	0	0	0	0	0
40524.35	0	0	0	0	0	0
40524.38	0	0	0	0	0	0
40524.4	0	0	0	0	0	0
40524.42	0	0	0	0	0	0
40524.44	0	0	0	0	0	0
40524.46	0	0	0	0	0	0
40524.48	0	0	0	0	0	0
40524.5	0	0	0	0	0	0

40524.52	0	0	0	0	0	0
40524.54	0	0	0	0	0	0
40524.56	0	0	0	0	0	0
40524.58	0	0	0	0	0	0
40524.6	0	0	0	0	0	0
40524.63	0	0	0	0	0	0
40524.65	0	0	0	0	0	0
40524.67	0	0	0	0	0	0
40524.69	0	0	0	0	0	0
40524.71	0	0	0	0	0	0
40524.73	0	0	0	0	0	0
40524.75	0	0	0	0	0	0
40524.77	0	0	0	0	0	0
40524.79	0	0	0	0	0	0
40524.81	0	0	0	0	0	0
40524.83	0	0	0	0	0	0
40524.85	0	0	0	0	0	0
40524.88	0	0	0	0	0	0
40524.9	0	0	0	0	0	0
40524.92	0	0	0	0	0	0
40524.94	0	0	0	0	0	0
40524.96	0	0	0	0	0	0
40524.98	0	0	0	0	0	0
40525	0	0	0	0	0	0
40525.02	0	0	0	0	0	0
40525.04	0	0	0	0	0	0
40525.06	0	0	0	0	0	0
40525.08	0	0	0	0	0	0
40525.1	0	0	0	0	0	0
40525.13	0	0	0	0	0	0
40525.15	0	0	0	0	0	0
40525.17	0	0	0	0	0	0
40525.19	0	0	0	0	0	0
40525.21	0	0	0	0	0	0
40525.23	0	0	0	0	0	0
40525.25	0	0	0	0	0	0
40525.27	0	0	0	0	0	0
40525.29	0	0	0	0	0	0
40525.31	0	0	0	0	0	0
40525.33	0	0	0	0	0	0
40525.35	0	0	0	0	0	0
40525.38	0	0	0	0	0	0
40525.4	0	0	0	0	0	0
40525.42	0	0	0	0	0	0
40525.44	0	0	0	0	0	0
40525.46	0	0	0	0	0	0
40525.48	0	0	0	0	0	0
40525.5	0	0	0	0	0	0
40525.52	0	0	0	0	0	0
40525.54	0	0	0	0	0	0

River Level	NUMINBAH	NUMINBAH	L_NERANG	L_NERANG	L_NERANG	L_NERANG	HINZE	HINZE	HINZE_DA
40513.38	0.95	0.95	168.1	168.09	168.09	168.09	35	82.26	94.5
40513.4	0.97	0.97	168.1	168.09	168.09	168.09	91.5	82.25	94.5
40513.42	1.01	1.01	168.02	168.11	168.11	168.11	91.5	82.26	94.5
40513.44	1.04	1.04	168.02	168.1	168.1	168.1	91.5	82.27	94.5
40513.46	1.07	1.07	168.02	168.13	168.13	168.13	91.5	82.28	94.5

40513.48	1.09	1.09	168.02	168.13	168.13	168.13	91.5	82.28	94.5
40513.5	1.09	1.09	168.02	168.14	168.14	168.14	91.5	82.27	94.5
40513.52	1.09	1.09	168.02	168.14	168.14	168.14	91.5	82.28	94.5
40513.54	1.09	1.09	168.02	168.14	168.14	168.14	91.5	82.27	94.5
40513.56	1.07	1.07	168.02	168.14	168.14	168.14	91.5	82.27	94.5
40513.58	1.05	1.05	168.02	168.16	168.16	168.16	91.5	82.27	94.5
40513.6	1.04	1.04	168.02	168.16	168.16	168.16	91.5	82.27	94.5
40513.63	1.03	1.03	168.02	168.15	168.15	168.15	91.5	82.27	94.5
40513.65	1.04	1.04	168.02	168.16	168.16	168.16	91.5	82.26	94.5
40513.67	1.05	1.05	168.02	168.16	168.16	168.16	91.5	82.24	94.5
40513.69	1.14	1.14	168.02	168.16	168.16	168.16	91.5	82.26	94.5
40513.71	1.25	1.25	168.03	168.17	168.17	168.17	91.5	82.24	94.5
40513.73	1.34	1.34	168.04	168.18	168.18	168.18	91.5	82.23	94.5
40513.75	1.41	1.41	168.05	168.19	168.19	168.19	91.5	82.24	94.5
40513.77	1.49	1.49	168.07	168.19	168.19	168.19	91.5	82.24	94.5
40513.79	1.49	1.49	168.09	168.2	168.2	168.2	91.5	82.25	94.5
40513.81	1.47	1.47	168.12	168.2	168.2	168.2	91.5	82.25	94.5
40513.83	1.47	1.47	168.13	168.2	168.2	168.2	91.5	82.25	94.5
40513.85	1.46	1.46	168.13	168.21	168.21	168.21	91.5	82.25	94.5
40513.88	1.45	1.45	168.14	168.21	168.21	168.21	91.5	82.24	94.5
40513.9	1.44	1.44	168.14	168.22	168.22	168.22	91.5	82.26	94.5
40513.92	1.41	1.41	168.15	168.22	168.22	168.22	91.5	82.27	94.5
40513.94	1.37	1.37	168.15	168.22	168.22	168.22	91.5	82.28	94.5
40513.96	1.35	1.35	168.16	168.22	168.22	168.22	91.5	82.28	94.5
40513.98	1.33	1.33	168.16	168.22	168.22	168.22	91.5	82.28	94.5
40514	1.31	1.31	168.16	168.22	168.22	168.22	91.5	82.28	94.5
40514.02	1.31	1.31	168.16	168.22	168.22	168.22	91.5	82.28	94.5
40514.04	1.31	1.31	168.16	168.22	168.22	168.22	91.5	82.28	94.5
40514.06	1.29	1.29	168.16	168.22	168.22	168.22	91.5	82.29	94.5
40514.08	1.28	1.28	168.15	168.23	168.23	168.23	91.5	82.29	94.5
40514.1	1.27	1.27	168.16	168.23	168.23	168.23	91.5	82.3	94.5
40514.13	1.26	1.26	168.16	168.24	168.24	168.24	91.5	82.29	94.5
40514.15	1.25	1.25	168.17	168.22	168.22	168.22	91.5	82.3	94.5
40514.17	1.25	1.25	168.15	168.22	168.22	168.22	91.5	82.41	94.5
40514.19	1.24	1.24	168.15	168.22	168.22	168.22	91.5	82.3	94.5
40514.21	1.22	1.22	168.15	168.28	168.28	168.28	91.5	82.31	94.5
40514.23	1.21	1.21	168.18	168.26	168.26	168.26	91.5	82.31	94.5
40514.25	1.2	1.2	168.2	168.24	168.24	168.24	91.5	82.32	94.5
40514.27	1.19	1.19	168.17	168.22	168.22	168.22	91.5	82.3	94.5
40514.29	1.19	1.19	168.15	168.2	168.2	168.2	91.5	82.3	94.5
40514.31	1.18	1.18	168.13	168.22	168.22	168.22	91.5	82.34	94.5
40514.33	1.17	1.17	168.15	168.2	168.2	168.2	91.5	82.35	94.5
40514.35	1.17	1.17	168.13	168.19	168.19	168.19	91.5	82.38	94.5
40514.38	1.17	1.17	168.12	168.18	168.18	168.18	91.5	82.38	94.5
40514.4	1.17	1.17	168.11	168.19	168.19	168.19	91.5	82.39	94.5
40514.42	1.17	1.17	168.12	168.2	168.2	168.2	91.5	82.38	94.5
40514.44	1.15	1.15	168.13	168.2	168.2	168.2	91.5	82.39	94.5
40514.46	1.14	1.14	168.13	168.19	168.19	168.19	91.5	82.4	94.5
40514.48	1.13	1.13	168.12	168.18	168.18	168.18	91.5	82.39	94.5
40514.5	1.13	1.13	168.11	168.19	168.19	168.19	91.5	82.36	94.5
40514.52	1.13	1.13	168.12	168.2	168.2	168.2	91.5	82.4	94.5
40514.54	1.13	1.13	168.12	168.19	168.19	168.19	91.5	82.42	94.5
40514.56	1.11	1.11	168.11	168.18	168.18	168.18	91.5	82.41	94.5
40514.58	1.11	1.11	168.11	168.18	168.18	168.18	91.5	82.38	94.5
40514.6	1.1	1.1	168.11	168.17	168.17	168.17	91.5	82.37	94.5
40514.63	1.1	1.1	168.1	168.17	168.17	168.17	91.5	82.37	94.5

40514.65	1.09	1.09	168.1	168.16	168.16	168.16	91.5	82.37	94.5
40514.67	1.09	1.09	168.09	168.17	168.17	168.17	91.5	82.38	94.5
40514.69	1.09	1.09	168.1	168.18	168.18	168.18	91.5	82.38	94.5
40514.71	1.09	1.09	168.11	168.18	168.18	168.18	91.5	82.37	94.5
40514.73	1.09	1.09	168.11	168.17	168.17	168.17	91.5	82.38	94.5
40514.75	1.09	1.09	168.1	168.17	168.17	168.17	91.5	82.38	94.5
40514.77	1.09	1.09	168.1	168.17	168.17	168.17	91.5	82.38	94.5
40514.79	1.09	1.09	168.11	168.16	168.16	168.16	91.5	82.38	94.5
40514.81	1.09	1.09	168.1	168.18	168.18	168.18	91.5	82.38	94.5
40514.83	1.09	1.09	168.12	168.18	168.18	168.18	91.5	82.37	94.5
40514.85	1.09	1.09	168.11	168.18	168.18	168.18	91.5	82.36	94.5
40514.88	1.08	1.08	168.11	168.18	168.18	168.18	91.5	82.36	94.5
40514.9	1.08	1.08	168.11	168.18	168.18	168.18	91.5	82.38	94.5
40514.92	1.08	1.08	168.11	168.18	168.18	168.18	91.5	82.39	94.5
40514.94	1.08	1.08	168.11	168.18	168.18	168.18	91.5	82.39	94.5
40514.96	1.08	1.08	168.11	168.18	168.18	168.18	91.5	82.4	94.5
40514.98	1.08	1.08	168.11	168.17	168.17	168.17	91.5	82.39	94.5
40515	1.08	1.08	168.1	168.16	168.16	168.16	91.5	82.4	94.5
40515.02	1.07	1.07	168.09	168.17	168.17	168.17	91.5	82.4	94.5
40515.04	1.07	1.07	168.1	168.18	168.18	168.18	91.5	82.39	94.5
40515.06	1.07	1.07	168.11	168.16	168.16	168.16	91.5	82.38	94.5
40515.08	1.07	1.07	168.1	168.17	168.17	168.17	91.5	82.38	94.5
40515.1	1.07	1.07	168.1	168.17	168.17	168.17	91.5	82.38	94.5
40515.13	1.07	1.07	168.1	168.18	168.18	168.18	91.5	82.39	94.5
40515.15	1.07	1.07	168.11	168.16	168.16	168.16	91.5	82.39	94.5
40515.17	1.07	1.07	168.1	168.16	168.16	168.16	91.5	82.4	94.5
40515.19	1.07	1.07	168.09	168.16	168.16	168.16	91.5	82.39	94.5
40515.21	1.06	1.06	168.09	168.16	168.16	168.16	91.5	82.39	94.5
40515.23	1.06	1.06	168.09	168.16	168.16	168.16	91.5	82.4	94.5
40515.25	1.06	1.06	168.09	168.16	168.16	168.16	91.5	82.4	94.5
40515.27	1.05	1.05	168.09	168.16	168.16	168.16	91.5	82.41	94.5
40515.29	1.05	1.05	168.09	168.16	168.16	168.16	91.5	82.4	94.5
40515.31	1.05	1.05	168.09	168.16	168.16	168.16	91.5	82.42	94.5
40515.33	1.05	1.05	168.09	168.16	168.16	168.16	91.5	82.42	94.5
40515.35	1.05	1.05	168.09	168.16	168.16	168.16	91.51	82.42	94.5
40515.38	1.05	1.05	168.09	168.16	168.16	168.16	91.51	82.42	94.5
40515.4	1.05	1.05	168.09	168.16	168.16	168.16	91.51	82.42	94.5
40515.42	1.05	1.05	168.09	168.16	168.16	168.16	91.51	82.41	94.5
40515.44	1.05	1.05	168.1	168.16	168.16	168.16	91.51	82.41	94.5
40515.46	1.05	1.05	168.1	168.16	168.16	168.16	91.51	82.4	94.5
40515.48	1.05	1.05	168.09	168.16	168.16	168.16	91.51	82.41	94.5
40515.5	1.05	1.05	168.1	168.16	168.16	168.16	91.51	82.41	94.5
40515.52	1.05	1.05	168.1	168.16	168.16	168.16	91.51	82.42	94.5
40515.54	1.05	1.05	168.1	168.16	168.16	168.16	91.51	82.43	94.5
40515.56	1.07	1.07	168.1	168.16	168.16	168.16	91.51	82.43	94.5
40515.58	1.07	1.07	168.1	168.16	168.16	168.16	91.51	82.44	94.5
40515.6	1.07	1.07	168.1	168.16	168.16	168.16	91.51	82.42	94.5
40515.63	1.07	1.07	168.1	168.16	168.16	168.16	91.51	82.42	94.5
40515.65	1.07	1.07	168.1	168.16	168.16	168.16	91.51	82.41	94.5
40515.67	1.07	1.07	168.11	168.16	168.16	168.16	91.51	82.42	94.5
40515.69	1.08	1.08	168.11	168.16	168.16	168.16	91.51	82.41	94.5
40515.71	1.09	1.09	168.11	168.17	168.17	168.17	91.51	82.4	94.5
40515.73	1.1	1.1	168.12	168.17	168.17	168.17	91.51	82.41	94.5
40515.75	1.11	1.11	168.12	168.18	168.18	168.18	91.51	82.41	94.5
40515.77	1.11	1.11	168.12	168.18	168.18	168.18	91.51	82.4	94.5
40515.79	1.11	1.11	168.12	168.17	168.17	168.17	91.51	82.4	94.5

40515.81	1.12	1.12	168.12	168.16	168.16	168.16	91.51	82.41	94.5
40515.83	1.13	1.13	168.11	168.18	168.18	168.18	91.51	82.41	94.5
40515.85	1.13	1.13	168.12	168.18	168.18	168.18	91.51	82.4	94.5
40515.88	1.13	1.13	168.12	168.18	168.18	168.18	91.51	82.4	94.5
40515.9	1.13	1.13	168.12	168.18	168.18	168.18	91.51	82.4	94.5
40515.92	1.13	1.13	168.11	168.18	168.18	168.18	91.51	82.4	94.5
40515.94	1.12	1.12	168.11	168.18	168.18	168.18	91.51	82.41	94.5
40515.96	1.11	1.11	168.11	168.18	168.18	168.18	91.51	82.42	94.5
40515.98	1.11	1.11	168.11	168.18	168.18	168.18	91.51	82.42	94.5
40516	1.11	1.11	168.11	168.18	168.18	168.18	91.51	82.42	94.5
40516.02	1.11	1.11	168.11	168.18	168.18	168.18	91.51	82.42	94.5
40516.04	1.11	1.11	168.12	168.18	168.18	168.18	91.51	82.41	94.5
40516.06	1.09	1.09	168.12	168.18	168.18	168.18	91.51	82.42	94.5
40516.08	1.1	1.1	168.12	168.18	168.18	168.18	91.51	82.41	94.5
40516.1	1.11	1.11	168.12	168.18	168.18	168.18	91.51	82.4	94.5
40516.13	1.12	1.12	168.13	168.18	168.18	168.18	91.51	82.41	94.5
40516.15	1.13	1.13	168.13	168.18	168.18	168.18	91.51	82.4	94.5
40516.17	1.13	1.13	168.12	168.18	168.18	168.18	91.51	82.41	94.5
40516.19	1.14	1.14	168.12	168.18	168.18	168.18	91.51	82.4	94.5
40516.21	1.15	1.15	168.12	168.18	168.18	168.18	91.51	82.41	94.5
40516.23	1.16	1.16	168.12	168.18	168.18	168.18	91.51	82.42	94.5
40516.25	1.16	1.16	168.12	168.18	168.18	168.18	91.51	82.4	94.5
40516.27	1.17	1.17	168.12	168.18	168.18	168.18	91.51	82.42	94.5
40516.29	1.17	1.17	168.12	168.18	168.18	168.18	91.51	82.43	94.5
40516.31	1.16	1.16	168.12	168.18	168.18	168.18	91.51	82.44	94.5
40516.33	1.16	1.16	168.12	168.19	168.19	168.19	91.51	82.44	94.5
40516.35	1.15	1.15	168.13	168.18	168.18	168.18	91.51	82.43	94.5
40516.38	1.16	1.16	168.12	168.2	168.2	168.2	91.51	82.43	94.5
40516.4	1.17	1.17	168.14	168.19	168.19	168.19	91.51	82.44	94.5
40516.42	1.17	1.17	168.13	168.2	168.2	168.2	91.51	82.43	94.5
40516.44	1.21	1.21	168.16	168.2	168.2	168.2	91.51	82.43	94.5
40516.46	1.27	1.27	168.19	168.21	168.21	168.21	91.51	82.45	94.5
40516.48	1.35	1.35	168.23	168.23	168.23	168.23	91.51	82.46	94.5
40516.5	1.49	1.49	168.26	168.24	168.24	168.24	91.51	82.47	94.5
40516.52	1.54	1.54	168.3	168.25	168.25	168.25	91.51	82.46	94.5
40516.54	1.58	1.58	168.33	168.26	168.26	168.26	91.51	82.44	94.5
40516.56	1.64	1.64	168.36	168.26	168.26	168.26	91.51	82.46	94.5
40516.58	1.73	1.73	168.41	168.3	168.3	168.3	91.51	82.48	94.5
40516.6	1.81	1.81	168.44	168.33	168.33	168.33	91.51	82.49	94.5
40516.63	1.85	1.85	168.45	168.34	168.34	168.34	91.51	82.49	94.5
40516.65	1.84	1.84	168.44	168.38	168.38	168.38	91.51	82.57	94.5
40516.67	1.83	1.83	168.43	168.4	168.4	168.4	91.51	82.53	94.5
40516.69	1.81	1.81	168.4	168.38	168.38	168.38	91.51	82.54	94.5
40516.71	1.8	1.8	168.38	168.41	168.41	168.41	91.51	82.55	94.5
40516.73	1.77	1.77	168.4	168.41	168.41	168.41	91.51	82.56	94.5
40516.75	1.74	1.74	168.4	168.4	168.4	168.4	91.51	82.56	94.5
40516.77	1.72	1.72	168.38	168.4	168.4	168.4	91.51	82.58	94.5
40516.79	1.7	1.7	168.38	168.4	168.4	168.4	91.51	82.59	94.5
40516.81	1.68	1.68	168.38	168.4	168.4	168.4	91.51	82.6	94.5
40516.83	1.67	1.67	168.37	168.39	168.39	168.39	91.51	82.59	94.5
40516.85	1.65	1.65	168.36	168.37	168.37	168.37	91.51	82.59	94.5
40516.88	1.63	1.63	168.33	168.36	168.36	168.36	91.51	82.6	94.5
40516.9	1.61	1.61	168.32	168.36	168.36	168.36	91.51	82.6	94.5
40516.92	1.59	1.59	168.32	168.36	168.36	168.36	91.51	82.61	94.5
40516.94	1.57	1.57	168.32	168.36	168.36	168.36	91.51	82.61	94.5
40516.96	1.55	1.55	168.32	168.35	168.35	168.35	91.51	82.62	94.5

40516.98	1.53	1.53	168.31	168.34	168.34	168.34	91.52	82.61	94.5
40517	1.51	1.51	168.3	168.33	168.33	168.33	91.52	82.62	94.5
40517.02	1.5	1.5	168.29	168.33	168.33	168.33	91.52	82.64	94.5
40517.04	1.49	1.49	168.29	168.32	168.32	168.32	91.52	82.63	94.5
40517.06	1.48	1.48	168.28	168.32	168.32	168.32	91.52	82.63	94.5
40517.08	1.47	1.47	168.28	168.31	168.31	168.31	91.52	82.64	94.5
40517.1	1.46	1.46	168.27	168.3	168.3	168.3	91.52	82.63	94.5
40517.13	1.45	1.45	168.26	168.29	168.29	168.29	91.52	82.64	94.5
40517.15	1.44	1.44	168.25	168.28	168.28	168.28	91.52	82.64	94.5
40517.17	1.43	1.43	168.24	168.28	168.28	168.28	91.52	82.65	94.5
40517.19	1.43	1.43	168.25	168.3	168.3	168.3	91.52	82.66	94.5
40517.21	1.45	1.45	168.29	168.32	168.32	168.32	91.52	82.64	94.5
40517.23	1.49	1.49	168.34	168.33	168.33	168.33	91.52	82.65	94.5
40517.25	1.61	1.61	168.38	168.34	168.34	168.34	91.52	82.67	94.5
40517.27	1.73	1.73	168.43	168.35	168.35	168.35	91.52	82.7	94.5
40517.29	1.87	1.87	168.47	168.41	168.41	168.41	91.52	82.73	94.5
40517.31	1.95	1.95	168.5	168.48	168.48	168.48	91.52	82.77	94.5
40517.33	1.93	1.93	168.51	168.51	168.51	168.51	91.52	82.82	94.5
40517.35	1.86	1.86	168.54	168.53	168.53	168.53	91.52	82.85	94.5
40517.38	1.8	1.8	168.57	168.54	168.54	168.54	91.52	82.9	94.5
40517.4	1.78	1.78	168.57	168.59	168.59	168.59	91.52	82.93	94.5
40517.42	1.78	1.78	168.61	168.6	168.6	168.6	91.52	82.95	94.5
40517.44	1.79	1.79	168.61	168.6	168.6	168.6	91.52	82.98	94.5
40517.46	1.83	1.83	168.6	168.58	168.58	168.58	91.52	83	94.5
40517.48	1.91	1.91	168.6	168.63	168.63	168.63	91.52	83.02	94.5
40517.5	2.37	2.37	168.68	168.68	168.68	168.68	91.53	83.07	94.5
40517.52	2.65	2.65	168.74	168.76	168.76	168.76	91.53	83.1	94.5
40517.54	2.64	2.64	168.79	168.8	168.8	168.8	91.53	83.12	94.5
40517.56	2.47	2.47	168.79	168.82	168.82	168.82	91.53	83.14	94.5
40517.58	2.33	2.33	168.8	168.79	168.79	168.79	91.53	83.14	94.5
40517.6	2.19	2.19	168.76	168.77	168.77	168.77	91.53	83.18	94.5
40517.63	2.11	2.11	168.73	168.74	168.74	168.74	91.53	83.19	94.5
40517.65	2.03	2.03	168.69	168.72	168.72	168.72	91.53	83.21	94.5
40517.67	1.96	1.96	168.67	168.68	168.68	168.68	91.53	83.22	94.5
40517.69	1.9	1.9	168.63	168.64	168.64	168.64	91.53	83.22	94.5
40517.71	1.85	1.85	168.6	168.64	168.64	168.64	91.53	83.23	94.5
40517.73	1.82	1.82	168.6	168.61	168.61	168.61	91.53	83.22	94.5
40517.75	1.8	1.8	168.57	168.58	168.58	168.58	91.53	83.22	94.5
40517.77	1.78	1.78	168.54	168.58	168.58	168.58	91.53	83.24	94.5
40517.79	1.76	1.76	168.54	168.56	168.56	168.56	91.53	83.25	94.5
40517.81	1.74	1.74	168.52	168.55	168.55	168.55	91.53	83.24	94.5
40517.83	1.73	1.73	168.51	168.52	168.52	168.52	91.54	83.25	94.5
40517.85	1.71	1.71	168.48	168.53	168.53	168.53	91.54	83.25	94.5
40517.88	1.68	1.68	168.49	168.51	168.51	168.51	91.54	83.27	94.5
40517.9	1.67	1.67	168.46	168.5	168.5	168.5	91.54	83.28	94.5
40517.92	1.66	1.66	168.45	168.49	168.49	168.49	91.54	83.27	94.5
40517.94	1.65	1.65	168.44	168.48	168.48	168.48	91.54	83.27	94.5
40517.96	1.64	1.64	168.43	168.48	168.48	168.48	91.54	83.28	94.5
40517.98	1.62	1.62	168.42	168.46	168.46	168.46	91.54	83.27	94.5
40518	1.6	1.6	168.4	168.45	168.45	168.45	91.54	83.28	94.5
40518.02	1.59	1.59	168.39	168.44	168.44	168.44	91.54	83.27	94.5
40518.04	1.58	1.58	168.38	168.42	168.42	168.42	91.54	83.3	94.5
40518.06	1.57	1.57	168.37	168.44	168.44	168.44	91.54	83.28	94.5
40518.08	1.57	1.57	168.38	168.44	168.44	168.44	91.54	83.29	94.5
40518.1	1.56	1.56	168.38	168.42	168.42	168.42	91.54	83.3	94.5
40518.13	1.55	1.55	168.36	168.42	168.42	168.42	91.54	83.3	94.5

40518.15	1.53	1.53	168.36	168.39	168.39	168.39	91.54	83.28	94.5
40518.17	1.52	1.52	168.33	168.38	168.38	168.38	91.54	83.29	94.5
40518.19	1.51	1.51	168.32	168.4	168.4	168.4	91.54	83.28	94.5
40518.21	1.51	1.51	168.34	168.39	168.39	168.39	91.54	83.29	94.5
40518.23	1.51	1.51	168.33	168.38	168.38	168.38	91.54	83.29	94.5
40518.25	1.49	1.49	168.32	168.37	168.37	168.37	91.54	83.29	94.5
40518.27	1.48	1.48	168.31	168.37	168.37	168.37	91.54	83.29	94.5
40518.29	1.47	1.47	168.31	168.37	168.37	168.37	91.54	83.32	94.5
40518.31	1.47	1.47	168.31	168.36	168.36	168.36	91.54	83.34	94.5
40518.33	1.46	1.46	168.3	168.36	168.36	168.36	91.54	83.33	94.5
40518.35	1.45	1.45	168.3	168.35	168.35	168.35	91.54	83.34	94.5
40518.38	1.45	1.45	168.3	168.34	168.34	168.34	91.54	83.31	94.5
40518.4	1.44	1.44	168.29	168.34	168.34	168.34	91.54	83.3	94.5
40518.42	1.44	1.44	168.3	168.33	168.33	168.33	91.54	83.3	94.5
40518.44	1.43	1.43	168.29	168.36	168.36	168.36	91.54	83.31	94.5
40518.46	1.43	1.43	168.32	168.35	168.35	168.35	91.54	83.31	94.5
40518.48	1.43	1.43	168.31	168.34	168.34	168.34	91.54	83.31	94.5
40518.5	1.44	1.44	168.31	168.34	168.34	168.34	91.54	83.31	94.5
40518.52	1.45	1.45	168.31	168.35	168.35	168.35	91.54	83.29	94.5
40518.54	1.46	1.46	168.33	168.35	168.35	168.35	91.54	83.3	94.5
40518.56	1.51	1.51	168.34	168.36	168.36	168.36	91.54	83.29	94.5
40518.58	1.63	1.63	168.35	168.38	168.38	168.38	91.54	83.29	94.5
40518.6	1.67	1.67	168.37	168.4	168.4	168.4	91.54	83.3	94.5
40518.63	1.69	1.69	168.4	168.41	168.41	168.41	91.54	83.3	94.5
40518.65	1.7	1.7	168.41	168.4	168.4	168.4	91.54	83.29	94.5
40518.67	1.71	1.71	168.39	168.43	168.43	168.43	91.54	83.28	94.5
40518.69	1.81	1.81	168.41	168.44	168.44	168.44	91.54	83.29	94.5
40518.71	1.83	1.83	168.43	168.46	168.46	168.46	91.54	83.28	94.5
40518.73	1.8	1.8	168.44	168.46	168.46	168.46	91.54	83.27	94.5
40518.75	1.75	1.75	168.43	168.45	168.45	168.45	91.54	83.26	94.5
40518.77	1.71	1.71	168.42	168.45	168.45	168.45	91.55	83.28	94.5
40518.79	1.68	1.68	168.42	168.45	168.45	168.45	91.55	83.27	94.5
40518.81	1.65	1.65	168.41	168.44	168.44	168.44	91.55	83.27	94.5
40518.83	1.63	1.63	168.4	168.42	168.42	168.42	91.55	83.25	94.5
40518.85	1.61	1.61	168.38	168.43	168.43	168.43	91.55	83.24	94.5
40518.88	1.62	1.62	168.4	168.43	168.43	168.43	91.55	83.25	94.5
40518.9	1.62	1.62	168.4	168.42	168.42	168.42	91.55	83.26	94.5
40518.92	1.63	1.63	168.4	168.44	168.44	168.44	91.55	83.24	94.5
40518.94	1.65	1.65	168.43	168.44	168.44	168.44	91.55	83.24	94.5
40518.96	1.69	1.69	168.43	168.45	168.45	168.45	91.55	83.25	94.5
40518.98	1.74	1.74	168.44	168.44	168.44	168.44	91.55	83.24	94.5
40519	1.83	1.83	168.42	168.46	168.46	168.46	91.55	83.24	94.5
40519.02	1.84	1.84	168.44	168.46	168.46	168.46	91.55	83.25	94.5
40519.04	1.83	1.83	168.44	168.48	168.48	168.48	91.55	83.25	94.5
40519.06	1.79	1.79	168.45	168.46	168.46	168.46	91.55	83.25	94.5
40519.08	1.77	1.77	168.43	168.48	168.48	168.48	91.55	83.27	94.5
40519.1	1.76	1.76	168.46	168.48	168.48	168.48	91.55	83.26	94.5
40519.13	1.77	1.77	168.46	168.47	168.47	168.47	91.55	83.28	94.5
40519.15	1.79	1.79	168.46	168.49	168.49	168.49	91.55	83.27	94.5
40519.17	1.81	1.81	168.48	168.5	168.5	168.5	91.55	83.27	94.5
40519.19	1.83	1.83	168.48	168.5	168.5	168.5	91.55	83.41	94.5
40519.21	1.83	1.83	168.48	168.51	168.51	168.51	91.55	83.32	94.5
40519.23	1.82	1.82	168.48	168.51	168.51	168.51	91.55	83.3	94.5
40519.25	1.8	1.8	168.48	168.5	168.5	168.5	91.55	83.29	94.5
40519.27	1.78	1.78	168.47	168.5	168.5	168.5	91.55	83.29	94.5
40519.29	1.75	1.75	168.46	168.5	168.5	168.5	91.55	83.32	94.5

40519.31	1.74	1.74	168.46	168.48	168.48	168.48	91.55	83.3	94.5
40519.33	1.73	1.73	168.44	168.48	168.48	168.48	91.55	83.31	94.5
40519.35	1.73	1.73	168.44	168.5	168.5	168.5	91.55	83.33	94.5
40519.38	1.72	1.72	168.46	168.47	168.47	168.47	91.55	83.33	94.5
40519.4	1.71	1.71	168.44	168.48	168.48	168.48	91.55	83.34	94.5
40519.42	1.72	1.72	168.47	168.49	168.49	168.49	91.55	83.35	94.5
40519.44	1.76	1.76	168.49	168.49	168.49	168.49	91.55	83.35	94.5
40519.46	1.95	1.95	168.49	168.5	168.5	168.5	91.55	83.34	94.5
40519.48	2.21	2.21	168.49	168.5	168.5	168.5	91.55	83.35	94.5
40519.5	2.35	2.35	168.49	168.54	168.54	168.54	91.55	83.37	94.5
40519.52	2.29	2.29	168.53	168.54	168.54	168.54	91.56	83.38	94.5
40519.54	2.15	2.15	168.52	168.52	168.52	168.52	91.56	83.39	94.5
40519.56	2.05	2.05	168.49	168.52	168.52	168.52	91.56	83.39	94.5
40519.58	1.99	1.99	168.49	168.54	168.54	168.54	91.56	83.41	94.5
40519.6	1.96	1.96	168.51	168.51	168.51	168.51	91.56	83.4	94.5
40519.63	1.92	1.92	168.47	168.5	168.5	168.5	91.56	83.41	94.5
40519.65	1.88	1.88	168.46	168.5	168.5	168.5	91.56	83.39	94.5
40519.67	1.88	1.88	168.46	168.48	168.48	168.48	91.56	83.4	94.5
40519.69	1.89	1.89	168.44	168.48	168.48	168.48	91.56	83.38	94.5
40519.71	1.89	1.89	168.44	168.5	168.5	168.5	91.56	83.4	94.5
40519.73	1.88	1.88	168.46	168.49	168.49	168.49	91.56	83.38	94.5
40519.75	1.85	1.85	168.46	168.48	168.48	168.48	91.56	83.39	94.5
40519.77	1.85	1.85	168.46	168.48	168.48	168.48	91.56	83.36	94.5
40519.79	1.85	1.85	168.47	168.49	168.49	168.49	91.56	83.38	94.5
40519.81	1.91	1.91	168.49	168.5	168.5	168.5	91.56	83.38	94.5
40519.83	2.11	2.11	168.49	168.52	168.52	168.52	91.56	83.38	94.5
40519.85	2.19	2.19	168.51	168.51	168.51	168.51	91.56	83.4	94.5
40519.88	2.17	2.17	168.49	168.5	168.5	168.5	91.56	83.39	94.5
40519.9	2.08	2.08	168.48	168.5	168.5	168.5	91.56	83.39	94.5
40519.92	2.02	2.02	168.48	168.52	168.52	168.52	91.56	83.34	94.5
40519.94	1.98	1.98	168.5	168.52	168.52	168.52	91.56	83.42	94.5
40519.96	1.95	1.95	168.5	168.51	168.51	168.51	91.56	83.43	94.5
40519.98	1.92	1.92	168.49	168.5	168.5	168.5	91.56	83.43	94.5
40520	1.9	1.9	168.47	168.5	168.5	168.5	91.56	83.44	94.5
40520.02	1.87	1.87	168.48	168.5	168.5	168.5	91.56	83.42	94.5
40520.04	1.85	1.85	168.48	168.5	168.5	168.5	91.56	83.43	94.5
40520.06	1.83	1.83	168.48	168.5	168.5	168.5	91.56	83.44	94.5
40520.08	1.83	1.83	168.48	168.48	168.48	168.48	91.56	83.45	94.5
40520.1	1.84	1.84	168.47	168.5	168.5	168.5	91.56	83.45	94.5
40520.13	1.86	1.86	168.5	168.51	168.51	168.51	91.56	83.46	94.5
40520.15	1.87	1.87	168.51	168.52	168.52	168.52	91.57	83.48	94.5
40520.17	1.89	1.89	168.51	168.52	168.52	168.52	91.57	83.46	94.5
40520.19	1.88	1.88	168.5	168.53	168.53	168.53	91.57	83.47	94.5
40520.21	1.87	1.87	168.51	168.5	168.5	168.5	91.57	83.48	94.5
40520.23	1.84	1.84	168.47	168.51	168.51	168.51	91.57	83.49	94.5
40520.25	1.81	1.81	168.48	168.49	168.49	168.49	91.57	83.5	94.5
40520.27	1.79	1.79	168.45	168.49	168.49	168.49	91.57	83.5	94.5
40520.29	1.76	1.76	168.45	168.5	168.5	168.5	91.57	83.51	94.5
40520.31	1.74	1.74	168.46	168.48	168.48	168.48	91.57	83.51	94.5
40520.33	1.73	1.73	168.44	168.48	168.48	168.48	91.57	83.5	94.5
40520.35	1.73	1.73	168.45	168.47	168.47	168.47	91.57	83.52	94.5
40520.38	1.74	1.74	168.44	168.47	168.47	168.47	91.57	83.54	94.5
40520.4	1.74	1.74	168.44	168.47	168.47	168.47	91.57	83.54	94.5
40520.42	1.75	1.75	168.44	168.46	168.46	168.46	91.57	83.55	94.5
40520.44	1.74	1.74	168.42	168.46	168.46	168.46	91.57	83.55	94.5
40520.46	1.73	1.73	168.42	168.46	168.46	168.46	91.57	83.54	94.5

40520.48	1.72	1.72	168.42	168.46	168.46	168.46	91.57	83.56	94.5
40520.5	1.71	1.71	168.42	168.45	168.45	168.45	91.57	83.55	94.5
40520.52	1.7	1.7	168.41	168.45	168.45	168.45	91.57	83.55	94.5
40520.54	1.69	1.69	168.41	168.44	168.44	168.44	91.57	83.53	94.5
40520.56	1.68	1.68	168.39	168.44	168.44	168.44	91.57	83.53	94.5
40520.58	1.66	1.66	168.39	168.46	168.46	168.46	91.57	83.53	94.5
40520.6	1.65	1.65	168.41	168.45	168.45	168.45	91.57	83.55	94.5
40520.63	1.64	1.64	168.4	168.44	168.44	168.44	91.57	83.56	94.5
40520.65	1.63	1.63	168.38	168.44	168.44	168.44	91.57	83.54	94.5
40520.67	1.62	1.62	168.38	168.44	168.44	168.44	91.57	83.52	94.5
40520.69	1.6	1.6	168.38	168.42	168.42	168.42	91.57	83.51	94.5
40520.71	1.59	1.59	168.36	168.42	168.42	168.42	91.57	83.51	94.5
40520.73	1.64	1.64	168.36	168.4	168.4	168.4	91.57	83.46	94.5
40520.75	1.6	1.6	168.34	168.4	168.4	168.4	91.57	83.45	94.5
40520.77	1.57	1.57	168.34	168.4	168.4	168.4	91.57	83.44	94.5
40520.79	1.56	1.56	168.34	168.42	168.42	168.42	91.57	83.43	94.5
40520.81	1.55	1.55	168.36	168.4	168.4	168.4	91.57	83.43	94.5
40520.83	1.55	1.55	168.34	168.39	168.39	168.39	91.57	83.41	94.5
40520.85	1.55	1.55	168.34	168.4	168.4	168.4	91.57	83.39	94.5
40520.88	1.54	1.54	168.35	168.39	168.39	168.39	91.57	83.38	94.5
40520.9	1.53	1.53	168.34	168.39	168.39	168.39	91.57	83.39	94.5
40520.92	1.53	1.53	168.34	168.39	168.39	168.39	91.57	83.37	94.5
40520.94	1.53	1.53	168.33	168.4	168.4	168.4	91.57	83.36	94.5
40520.96	1.53	1.53	168.34	168.38	168.38	168.38	91.57	83.34	94.5
40520.98	1.53	1.53	168.33	168.37	168.37	168.37	91.57	83.35	94.5
40521	1.52	1.52	168.32	168.37	168.37	168.37	91.57	83.35	94.5
40521.02	1.51	1.51	168.32	168.36	168.36	168.36	91.57	83.34	94.5
40521.04	1.5	1.5	168.31	168.37	168.37	168.37	91.57	83.33	94.5
40521.06	1.5	1.5	168.32	168.38	168.38	168.38	91.57	83.32	94.5
40521.08	1.49	1.49	168.33	168.36	168.36	168.36	91.57	83.31	94.5
40521.1	1.49	1.49	168.31	168.35	168.35	168.35	91.57	83.31	94.5
40521.13	1.48	1.48	168.3	168.34	168.34	168.34	91.57	83.29	94.5
40521.15	1.48	1.48	168.29	168.34	168.34	168.34	91.57	83.29	94.5
40521.17	1.48	1.48	168.29	168.36	168.36	168.36	91.57	83.3	94.5
40521.19	1.47	1.47	168.31	168.36	168.36	168.36	91.57	83.27	94.5
40521.21	1.47	1.47	168.31	168.36	168.36	168.36	91.57	83.26	94.5
40521.23	1.47	1.47	168.3	168.35	168.35	168.35	91.57	83.27	94.5
40521.25	1.45	1.45	168.3	168.33	168.33	168.33	91.57	83.28	94.5
40521.27	1.45	1.45	168.28	168.33	168.33	168.33	91.57	83.3	94.5
40521.29	1.44	1.44	168.28	168.32	168.32	168.32	91.57	83.33	94.5
40521.31	1.44	1.44	168.27	168.32	168.32	168.32	91.57	83.34	94.5
40521.33	1.43	1.43	168.27	168.33	168.33	168.33	91.57	83.31	94.5
40521.35	1.43	1.43	168.28	168.33	168.33	168.33	91.57	83.29	94.5
40521.38	1.42	1.42	168.28	168.33	168.33	168.33	91.57	83.31	94.5
40521.4	1.42	1.42	168.28	168.33	168.33	168.33	91.58	83.32	94.5
40521.42	1.41	1.41	168.28	168.32	168.32	168.32	91.58	83.29	94.5
40521.44	1.41	1.41	168.27	168.32	168.32	168.32	91.58	83.3	94.5
40521.46	1.41	1.41	168.27	168.31	168.31	168.31	91.58	83.29	94.5
40521.48	1.4	1.4	168.26	168.3	168.3	168.3	91.58	83.24	94.5
40521.5	1.39	1.39	168.25	168.31	168.31	168.31	91.58	83.27	94.5
40521.52	1.38	1.38	168.26	168.31	168.31	168.31	91.58	83.25	94.5
40521.54	1.38	1.38	168.26	168.32	168.32	168.32	91.58	83.26	94.5
40521.56	1.37	1.37	168.27	168.32	168.32	168.32	91.58	83.25	94.5
40521.58	1.37	1.37	168.27	168.31	168.31	168.31	91.58	83.24	94.5
40521.6	1.37	1.37	168.26	168.31	168.31	168.31	91.58	83.21	94.5
40521.63	1.36	1.36	168.26	168.31	168.31	168.31	91.58	83.2	94.5

40521.65	1.36	1.36	168.26	168.31	168.31	168.31	91.58	83.21	94.5
40521.67	1.35	1.35	168.26	168.32	168.32	168.32	91.58	83.23	94.5
40521.69	1.35	1.35	168.26	168.3	168.3	168.3	91.58	83.21	94.5
40521.71	1.35	1.35	168.25	168.29	168.29	168.29	91.58	83.19	94.5
40521.73	1.35	1.35	168.24	168.29	168.29	168.29	91.58	83.17	94.5
40521.75	1.34	1.34	168.24	168.3	168.3	168.3	91.58	83.14	94.5
40521.77	1.33	1.33	168.25	168.3	168.3	168.3	91.58	83.1	94.5
40521.79	1.33	1.33	168.25	168.28	168.28	168.28	91.58	83.08	94.5
40521.81	1.33	1.33	168.22	168.29	168.29	168.29	91.58	83.06	94.5
40521.83	1.33	1.33	168.24	168.28	168.28	168.28	91.58	83.06	94.5
40521.85	1.33	1.33	168.22	168.29	168.29	168.29	91.58	83.05	94.5
40521.88	1.32	1.32	168.24	168.29	168.29	168.29	91.58	83.04	94.5
40521.9	1.31	1.31	168.24	168.28	168.28	168.28	91.58	83.03	94.5
40521.92	1.31	1.31	168.22	168.28	168.28	168.28	91.58	83.02	94.5
40521.94	1.31	1.31	168.22	168.28	168.28	168.28	91.58	83	94.5
40521.96	1.31	1.31	168.22	168.28	168.28	168.28	91.58	83.02	94.5
40521.98	1.31	1.31	168.22	168.28	168.28	168.28	91.58	82.99	94.5
40522	1.3	1.3	168.22	168.28	168.28	168.28	91.58	82.98	94.5
40522.02	1.3	1.3	168.22	168.28	168.28	168.28	91.58	82.97	94.5
40522.04	1.29	1.29	168.22	168.27	168.27	168.27	91.58	82.95	94.5
40522.06	1.29	1.29	168.21	168.26	168.26	168.26	91.58	82.94	94.5
40522.08	1.29	1.29	168.19	168.28	168.28	168.28	91.58	82.94	94.5
40522.1	1.29	1.29	168.22	168.26	168.26	168.26	91.58	82.92	94.5
40522.13	1.28	1.28	168.19	168.28	168.28	168.28	91.58	82.92	94.5
40522.15	1.28	1.28	168.22	168.28	168.28	168.28	91.58	82.92	94.5
40522.17	1.28	1.28	168.22	168.27	168.27	168.27	91.58	82.92	94.5
40522.19	1.27	1.27	168.21	168.26	168.26	168.26	91.58	82.88	94.5
40522.21	1.28	1.28	168.19	168.27	168.27	168.27	91.58	82.89	94.5
40522.23	1.27	1.27	168.21	168.26	168.26	168.26	91.58	82.9	94.5
40522.25	1.26	1.26	168.19	168.25	168.25	168.25	91.58	82.9	94.5
40522.27	1.26	1.26	168.18	168.25	168.25	168.25	91.58	82.9	94.5
40522.29	1.26	1.26	168.18	168.25	168.25	168.25	91.58	82.93	94.5
40522.31	1.25	1.25	168.18	168.24	168.24	168.24	91.58	82.96	94.5
40522.33	1.25	1.25	168.17	168.25	168.25	168.25	91.58	82.93	94.5
40522.35	1.25	1.25	168.18	168.25	168.25	168.25	91.58	82.93	94.5
40522.38	1.25	1.25	168.18	168.24	168.24	168.24	91.58	82.9	94.5
40522.4	1.24	1.24	168.17	168.26	168.26	168.26	91.58	82.91	94.5
40522.42	1.24	1.24	168.19	168.26	168.26	168.26	91.58	82.9	94.5
40522.44	1.24	1.24	168.19	168.26	168.26	168.26	91.58	82.92	94.5
40522.46	1.23	1.23	168.19	168.24	168.24	168.24	91.58	82.88	94.5
40522.48	1.23	1.23	168.17	168.25	168.25	168.25	91.58	82.87	94.5
40522.5	1.23	1.23	168.18	168.25	168.25	168.25	91.58	82.86	94.5
40522.52	1.23	1.23	168.18	168.25	168.25	168.25	91.58	82.86	94.5
40522.54	1.23	1.23	168.18	168.26	168.26	168.26	91.58	82.86	94.5
40522.56	1.17	-99	168.19	-99	168.26	-99	91.58	-99	94.5
40522.58	1.16	-99	168.19	-99	168.25	-99	91.58	-99	94.5
40522.6	1.17	-99	168.18	-99	168.25	-99	91.58	-99	94.5
40522.63	1.16	-99	168.18	-99	168.25	-99	91.58	-99	94.5
40522.65	1.17	-99	168.17	-99	168.24	-99	91.58	-99	94.5
40522.67	1.16	-99	168.17	-99	168.24	-99	91.58	-99	94.5
40522.69	1.16	-99	168.17	-99	168.24	-99	91.58	-99	94.5
40522.71	1.16	-99	168.16	-99	168.24	-99	91.58	-99	94.5
40522.73	1.16	-99	168.16	-99	168.23	-99	91.58	-99	94.5
40522.75	1.16	-99	168.16	-99	168.23	-99	91.58	-99	94.5
40522.77	1.16	-99	168.16	-99	168.23	-99	91.58	-99	94.5
40522.79	1.16	-99	168.16	-99	168.23	-99	91.58	-99	94.5

40522.81	1.16	-99	168.16	-99	168.23	-99	91.58	-99	94.5
40522.83	1.16	-99	168.15	-99	168.23	-99	91.58	-99	94.5
40522.85	1.16	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40522.88	1.16	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40522.9	1.16	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40522.92	1.16	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40522.94	1.16	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40522.96	1.16	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40522.98	1.16	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40523	1.15	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40523.02	1.16	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40523.04	1.15	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40523.06	1.15	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40523.08	1.15	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40523.1	1.15	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40523.13	1.15	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40523.15	1.15	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40523.17	1.15	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40523.19	1.15	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40523.21	1.15	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40523.23	1.15	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40523.25	1.15	-99	168.15	-99	168.22	-99	91.58	-99	94.5
40523.27	1.15	-99	168.14	-99	168.22	-99	91.58	-99	94.5
40523.29	1.15	-99	168.14	-99	168.22	-99	91.58	-99	94.5
40523.31	1.15	-99	168.14	-99	168.22	-99	91.58	-99	94.5
40523.33	1.15	-99	168.14	-99	168.22	-99	91.58	-99	94.5
40523.35	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.38	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.4	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.42	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.44	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.46	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.48	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.5	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.52	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.54	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.56	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.58	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.6	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.63	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.65	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.67	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.69	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.71	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.73	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.75	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.77	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.79	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.81	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.83	1.15	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.85	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.88	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.9	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.92	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.94	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40523.96	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5

40523.98	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.02	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.04	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.06	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.08	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.1	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.13	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.15	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.17	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.19	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.21	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.23	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.25	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.27	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.29	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.31	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.33	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.35	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.38	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.4	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.42	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.44	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.46	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.48	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.5	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.52	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.54	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.56	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.58	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.6	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.63	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.65	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.67	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.69	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.71	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.73	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.75	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.77	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.79	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.81	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.83	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.85	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.88	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.9	1.14	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.92	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.94	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.96	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40524.98	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.02	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.04	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.06	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.08	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.1	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.13	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5

40525.15	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.17	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.19	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.21	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.23	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.25	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.27	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.29	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.31	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.33	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.35	1.13	-99	168.14	-99	168.21	-99	91.58	-99	94.5
40525.38	1.13	-99	168.13	-99	168.21	-99	91.58	-99	94.5
40525.4	1.13	-99	168.13	-99	168.21	-99	91.58	-99	94.5
40525.42	1.13	-99	168.13	-99	168.21	-99	91.58	-99	94.5
40525.44	1.13	-99	168.13	-99	168.21	-99	91.58	-99	94.5
40525.46	1.13	-99	168.13	-99	168.21	-99	91.58	-99	94.5
40525.48	1.13	-99	168.13	-99	168.21	-99	91.58	-99	94.5
40525.5	1.13	-99	168.13	-99	168.21	-99	91.58	-99	94.5
40525.52	1.13	-99	168.13	-99	168.21	-99	91.58	-99	94.5
40525.54	1.13	-99	168.13	-99	168.21	-99	91.58	-99	94.5
Flow Rates	NUMINBAI	NUMINBAI	LND_INFL(	L_NERANG	L_NERANG	HD_INFLO'	HINZE_DA	HINZE_DA	CLEARVIE\
40513.38	3.42	3.42	0	2.43	2.43	5.85	0	0	0.69
40513.4	3.54	3.54	0	2.43	2.43	0	0	0	0.69
40513.42	3.99	3.99	0	3.13	3.13	0	0	0	0.69
40513.44	4.76	4.76	0	2.78	2.78	0	0	0	0.69
40513.46	5.53	5.53	0.01	3.83	3.83	0.01	0	0	0.69
40513.48	6.05	6.05	0.01	3.83	3.83	0.04	0	0	0.69
40513.5	6.05	6.05	0.01	4.17	4.17	0.14	0	0	0.68
40513.52	6.05	6.05	0.01	4.17	4.17	0.38	0	0	0.68
40513.54	6.05	6.05	0.01	4.17	4.17	0.84	0	0	0.68
40513.56	5.53	5.53	0.02	4.17	4.17	1.56	0	0	0.68
40513.58	5.02	5.02	0.03	4.87	4.87	2.48	0	0	0.68
40513.6	4.76	4.76	0.04	4.87	4.87	3.44	0	0	0.68
40513.63	4.5	4.5	0.04	4.52	4.52	4.24	0	0	0.68
40513.65	4.76	4.76	0.05	4.87	4.87	4.74	0	0	0.68
40513.67	5.02	5.02	0.2	4.87	4.87	5.11	0	0	0.68
40513.69	7.33	7.33	0.65	4.87	4.87	5.32	0	0	0.68
40513.71	10.17	10.17	2.2	5.22	5.22	5.56	0	0	0.68
40513.73	12.48	12.48	3.98	5.56	5.56	6.21	0	0	0.69
40513.75	14.28	14.28	4.71	5.91	5.91	8.08	0	0	0.69
40513.77	16.34	16.34	5.19	5.91	5.91	12.5	0	0	0.69
40513.79	16.34	16.34	5.87	6.26	6.26	17.8	0	0	0.69
40513.81	15.83	15.83	5.2	6.26	6.26	23.62	0	0	0.7
40513.83	15.83	15.83	4.52	6.26	6.26	29.04	0	0	0.72
40513.85	15.57	15.57	4.74	6.61	6.61	34.44	0	0	0.74
40513.88	15.31	15.31	4.23	6.61	6.61	39.45	0	0	0.75
40513.9	15.06	15.06	4.56	6.96	6.96	43.4	0	0	0.75
40513.92	14.28	14.28	4.55	6.96	6.96	45.49	0	0	0.76
40513.94	13.25	13.25	5.81	6.96	6.96	45.37	0	0	0.76
40513.96	12.74	12.74	7.33	6.96	6.96	43.61	0	0	0.75
40513.98	12.22	12.22	7.51	6.96	6.96	41.39	0	0	0.75
40514	11.71	11.71	7.65	6.96	6.96	39.16	0	0	0.75
40514.02	11.71	11.71	7.12	6.96	6.96	37.13	0	0	0.75
40514.04	11.71	11.71	6.31	6.96	6.96	35.24	0	0	0.74
40514.06	11.19	11.19	6.04	6.96	6.96	33.37	0	0	0.74
40514.08	10.94	10.94	6.08	7.3	7.3	31.38	0	0	0.74

40514.1	10.68	10.68	5.69	7.3	7.3	29.57	0	0	0.73
40514.13	10.42	10.42	5.78	7.65	7.65	27.91	0	0	0.73
40514.15	10.17	10.17	4.96	6.96	6.96	26.42	0	0	0.73
40514.17	10.17	10.17	5.48	6.96	6.96	25.1	0	0	0.73
40514.19	9.91	9.91	5.77	6.96	6.96	24.08	0	0	0.73
40514.21	9.39	9.39	6.61	9.92	9.92	23.16	0	0	0.72
40514.23	9.14	9.14	6.76	8.64	8.64	22.29	0	0	0.72
40514.25	8.88	8.88	5.04	7.65	7.65	21.3	0	0	0.72
40514.27	8.62	8.62	3.7	6.96	6.96	20.45	0	0	0.72
40514.29	8.62	8.62	3.16	6.26	6.26	19.9	0	0	0.72
40514.31	8.36	8.36	4.15	6.96	6.96	19.8	0	0	0.72
40514.33	8.11	8.11	3.73	6.26	6.26	19.66	0	0	0.72
40514.35	8.11	8.11	3.25	5.91	5.91	19.01	0	0	0.72
40514.38	8.11	8.11	2.76	5.56	5.56	17.61	0	0	0.71
40514.4	8.11	8.11	3.14	5.91	5.91	16.08	0	0	0.71
40514.42	8.11	8.11	3.55	6.26	6.26	15.05	0	0	0.71
40514.44	7.59	7.59	3.3	6.26	6.26	14.49	0	0	0.71
40514.46	7.33	7.33	2.59	5.91	5.91	13.88	0	0	0.71
40514.48	7.08	7.08	2.18	5.56	5.56	13.18	0	0	0.71
40514.5	7.08	7.08	2.44	5.91	5.91	12.62	0	0	0.71
40514.52	7.08	7.08	2.71	6.26	6.26	12.37	0	0	0.71
40514.54	7.08	7.08	2.35	5.91	5.91	12.28	0	0	0.71
40514.56	6.56	6.56	2.02	5.56	5.56	12.07	0	0	0.71
40514.58	6.56	6.56	2.51	5.56	5.56	11.58	0	0	0.72
40514.6	6.3	6.3	3.19	5.22	5.22	11.05	0	0	0.72
40514.63	6.3	6.3	3.89	5.22	5.22	10.86	0	0	0.74
40514.65	6.05	6.05	3.63	4.87	4.87	10.67	0	0	0.75
40514.67	6.05	6.05	3.75	5.22	5.22	10.57	0	0	0.76
40514.69	6.05	6.05	3.94	5.56	5.56	10.21	0	0	0.78
40514.71	6.05	6.05	3.96	5.56	5.56	9.71	0	0	0.8
40514.73	6.05	6.05	3.31	5.22	5.22	9.24	0	0	0.82
40514.75	6.05	6.05	3.21	5.22	5.22	8.96	0	0	0.84
40514.77	6.05	6.05	3.96	5.22	5.22	9	0	0	0.84
40514.79	6.05	6.05	4.18	4.87	4.87	9.37	0	0	0.84
40514.81	6.05	6.05	4.9	5.56	5.56	9.8	0	0	0.83
40514.83	6.05	6.05	4.28	5.56	5.56	10.02	0	0	0.83
40514.85	6.05	6.05	4.28	5.56	5.56	10.24	0	0	0.83
40514.88	5.79	5.79	3.86	5.56	5.56	12.18	0	0	0.84
40514.9	5.79	5.79	3.51	5.56	5.56	16.28	0	0	0.91
40514.92	5.79	5.79	3.57	5.56	5.56	18.99	0	0	1.18
40514.94	5.79	5.79	3.44	5.56	5.56	20.16	0	0	1.81
40514.96	5.79	5.79	3.59	5.56	5.56	20.06	0	0	2.68
40514.98	5.79	5.79	3.16	5.22	5.22	19.82	0	0	3.38
40515	5.79	5.79	3.02	4.87	4.87	19	0	0	3.62
40515.02	5.53	5.53	3.76	5.22	5.22	18.23	0	0	3.47
40515.04	5.53	5.53	4.04	5.56	5.56	17.65	0	0	3.2
40515.06	5.53	5.53	3.35	4.87	4.87	16.88	0	0	3
40515.08	5.53	5.53	2.99	5.22	5.22	16.08	0	0	2.86
40515.1	5.53	5.53	2.86	5.22	5.22	15.27	0	0	2.69
40515.13	5.53	5.53	3.17	5.56	5.56	14.49	0	0	2.55
40515.15	5.53	5.53	2.63	4.87	4.87	13.85	0	0	2.42
40515.17	5.53	5.53	2.24	4.87	4.87	13.27	0	0	2.3
40515.19	5.53	5.53	2.22	4.87	4.87	12.71	0	0	2.19
40515.21	5.27	5.27	2.38	4.87	4.87	12.1	0	0	2.09
40515.23	5.27	5.27	2.38	4.87	4.87	11.66	0	0	2
40515.25	5.27	5.27	2.27	4.87	4.87	11.24	0	0	1.91

40515.27	5.02	5.02	2.19	4.87	4.87	10.79	0	0	1.84
40515.29	5.02	5.02	2.2	4.87	4.87	10.46	0	0	1.76
40515.31	5.02	5.02	2.21	4.87	4.87	10.3	0	0	1.71
40515.33	5.02	5.02	2.12	4.87	4.87	10.19	0	0	1.67
40515.35	5.02	5.02	2.03	4.87	4.87	10.21	0	0	1.67
40515.38	5.02	5.02	2.42	4.87	4.87	10.3	0	0	1.68
40515.4	5.02	5.02	2.77	4.87	4.87	10.31	0	0	1.67
40515.42	5.02	5.02	3.7	4.87	4.87	10.35	0	0	1.64
40515.44	5.02	5.02	4.25	4.87	4.87	10.5	0	0	1.6
40515.46	5.02	5.02	3.74	4.87	4.87	10.64	0	0	1.56
40515.48	5.02	5.02	3.53	4.87	4.87	11.04	0	0	1.54
40515.5	5.02	5.02	4.06	4.87	4.87	11.4	0	0	1.55
40515.52	5.02	5.02	4.61	4.87	4.87	12.71	0	0	1.6
40515.54	5.02	5.02	4.69	4.87	4.87	13.58	0	0	1.73
40515.56	5.53	5.53	4.3	4.87	4.87	14.39	0	0	1.94
40515.58	5.53	5.53	4.18	4.87	4.87	14.92	0	0	2.21
40515.6	5.53	5.53	4.2	4.87	4.87	15.6	0	0	2.42
40515.63	5.53	5.53	4.84	4.87	4.87	16.59	0	0	2.5
40515.65	5.53	5.53	6.04	4.87	4.87	20.61	0	0	2.55
40515.67	5.53	5.53	7.32	4.87	4.87	23.2	0	0	2.77
40515.69	5.79	5.79	6.79	4.87	4.87	24	0	0	3.17
40515.71	6.05	6.05	6.72	5.22	5.22	23.54	0	0	3.62
40515.73	6.3	6.3	6.94	5.22	5.22	23.56	0	0	4.02
40515.75	6.56	6.56	6.96	5.56	5.56	23.68	0	0	4.18
40515.77	6.56	6.56	6.2	5.56	5.56	24.36	0	0	4.07
40515.79	6.56	6.56	5.71	5.22	5.22	24.62	0	0	3.84
40515.81	6.82	6.82	5.06	4.87	4.87	24.19	0	0	3.7
40515.83	7.08	7.08	5.07	5.56	5.56	23.34	0	0	3.64
40515.85	7.08	7.08	5	5.56	5.56	22.63	0	0	3.55
40515.88	7.08	7.08	4.9	5.56	5.56	21.75	0	0	3.43
40515.9	7.08	7.08	4.39	5.56	5.56	21.02	0	0	3.3
40515.92	7.08	7.08	4.17	5.56	5.56	20.03	0	0	3.12
40515.94	6.82	6.82	4.01	5.56	5.56	19.27	0	0	2.95
40515.96	6.56	6.56	3.9	5.56	5.56	18.55	0	0	2.81
40515.98	6.56	6.56	3.74	5.56	5.56	18.15	0	0	2.66
40516	6.56	6.56	3.68	5.56	5.56	17.53	0	0	2.53
40516.02	6.56	6.56	4.12	5.56	5.56	16.97	0	0	2.41
40516.04	6.56	6.56	5.46	5.56	5.56	16.3	0	0	2.31
40516.06	6.05	6.05	5.41	5.56	5.56	15.94	0	0	2.22
40516.08	6.3	6.3	5.3	5.56	5.56	15.57	0	0	2.15
40516.1	6.56	6.56	7.96	5.56	5.56	15.46	0	0	2.1
40516.13	6.82	6.82	8.58	5.56	5.56	15.41	0	0	2.05
40516.15	7.08	7.08	6.14	5.56	5.56	15.79	0	0	2.01
40516.17	7.08	7.08	6.1	5.56	5.56	16.22	0	0	1.97
40516.19	7.33	7.33	5.97	5.56	5.56	16.72	0	0	1.94
40516.21	7.59	7.59	5.66	5.56	5.56	16.71	0	0	1.91
40516.23	7.85	7.85	6.05	5.56	5.56	16.71	0	0	1.87
40516.25	7.85	7.85	5.61	5.56	5.56	16.77	0	0	1.81
40516.27	8.11	8.11	5.2	5.56	5.56	17.24	0	0	1.74
40516.29	8.11	8.11	4.95	5.56	5.56	17.74	0	0	1.69
40516.31	7.85	7.85	4.75	5.56	5.56	18.22	0	0	1.64
40516.33	7.85	7.85	4.94	5.91	5.91	18.39	0	0	1.61
40516.35	7.59	7.59	4.44	5.56	5.56	18.44	0	0	1.59
40516.38	7.85	7.85	5.75	6.26	6.26	18.35	0	0	1.62
40516.4	8.11	8.11	5.14	5.91	5.91	18.6	0	0	1.63
40516.42	8.11	8.11	8.5	6.26	6.26	21.23	0	0	1.81

40516.44	9.14	9.14	15.8	6.26	6.26	27.81	0	0	2.92
40516.46	10.68	10.68	20.5	6.61	6.61	36.01	0	0	4.02
40516.48	12.74	12.74	22.2	7.3	7.3	43.02	0	0	4.83
40516.5	16.34	16.34	21.17	7.65	7.65	49.44	0	0	5.16
40516.52	18.29	18.29	21.29	8	8	54.96	0	0	5.55
40516.54	19.98	19.98	24.12	8.64	8.64	60.24	0	0	7.06
40516.56	22.51	22.51	29.95	8.64	8.64	67.43	0	0	8.22
40516.58	26.31	26.31	33.73	11.2	11.2	75.52	0	0	9.36
40516.6	29.68	29.68	29.76	13.12	13.12	82.9	0	0	9.94
40516.63	31.37	31.37	25.99	13.76	13.76	88.44	0	0	10.51
40516.65	30.95	30.95	25.41	16.32	16.32	94.88	0	0	10.73
40516.67	30.53	30.53	22.17	17.6	17.6	100.72	0	0	10.77
40516.69	29.68	29.68	20.07	16.32	16.32	105.43	0	0	10.24
40516.71	29.26	29.26	21.76	18.24	18.24	108.51	0	0	9.57
40516.73	27.99	27.99	22.37	18.24	18.24	110.29	0	0	8.71
40516.75	26.73	26.73	21.42	17.6	17.6	110.97	0	0	8.11
40516.77	25.88	25.88	19.52	17.6	17.6	110.4	0	0	7.48
40516.79	25.04	25.04	19.07	17.6	17.6	108.27	0	0	6.96
40516.81	24.2	24.2	19.35	17.6	17.6	104.6	0	0	6.45
40516.83	23.77	23.77	16.7	16.96	16.96	100	0	0	6.03
40516.85	22.93	22.93	14.22	15.68	15.68	95.46	0	0	5.62
40516.88	22.09	22.09	13.48	15.04	15.04	90.97	0	0	5.27
40516.9	21.24	21.24	13.23	15.04	15.04	86.02	0	0	4.93
40516.92	20.4	20.4	13.03	15.04	15.04	80.91	0	0	4.64
40516.94	19.55	19.55	12.39	15.04	15.04	76.14	0	0	4.38
40516.96	18.71	18.71	11.24	14.4	14.4	71.6	0	0	4.16
40516.98	17.87	17.87	10.23	13.76	13.76	67.27	0	0	3.97
40517	17.02	17.02	9.55	13.12	13.12	63.55	0	0	3.82
40517.02	16.6	16.6	9.56	13.12	13.12	60.26	0	0	3.67
40517.04	16.34	16.34	9.26	12.48	12.48	57.23	0	0	3.56
40517.06	16.09	16.09	9.44	12.48	12.48	54.37	0	0	3.48
40517.08	15.83	15.83	8.75	11.84	11.84	51.61	0	0	3.42
40517.1	15.57	15.57	7.88	11.2	11.2	49.07	0	0	3.35
40517.13	15.31	15.31	7.41	10.56	10.56	47.22	0	0	4.33
40517.15	15.06	15.06	7.39	9.92	9.92	49.76	0	0	5.64
40517.17	14.8	14.8	9.62	9.92	9.92	53.27	0	0	6.48
40517.19	14.8	14.8	13.32	11.2	11.2	55.99	0	0	7.43
40517.21	15.31	15.31	20.73	12.48	12.48	59.32	0	0	8.84
40517.23	16.34	16.34	28.83	13.12	13.12	63.28	0	0	12.41
40517.25	21.24	21.24	34.15	13.76	13.76	73.62	0	0	19.18
40517.27	26.31	26.31	37.92	14.4	14.4	91.31	0	0	22.71
40517.29	32.21	32.21	38.29	18.24	18.24	117.73	0	0	25.39
40517.31	35.59	35.59	38.04	22.72	22.72	149.06	0	0	29.16
40517.33	34.75	34.75	39.03	24.8	24.8	191.27	0	0	32.73
40517.35	31.79	31.79	41.71	26.4	26.4	227.79	0	0	36.05
40517.38	29.26	29.26	39.98	27.2	27.2	242.63	0	0	40.27
40517.4	28.42	28.42	42.67	31.2	31.2	244.3	0	0	43.15
40517.42	28.42	28.42	41.24	32	32	239.45	0	0	46.78
40517.44	28.84	28.84	37.89	32	32	237.64	0	0	48.07
40517.46	30.53	30.53	37.22	30.4	30.4	237.47	0	0	46.39
40517.48	33.9	33.9	48.84	34.4	34.4	231.99	0	0	43.09
40517.5	61.23	61.23	59.3	38.4	38.4	221.06	0	0	40.09
40517.52	79.55	79.55	62.87	44.96	44.96	207.82	0	0	37.01
40517.54	78.88	78.88	53.44	48.8	48.8	198.93	0	0	34.94
40517.56	67.59	67.59	49.67	50.72	50.72	195.78	0	0	32.33
40517.58	58.69	58.69	46.83	47.84	47.84	194.14	0	0	30.11

40517.6	49.78	49.78	39.91	45.92	45.92	194.03	0	0	27.87
40517.63	44.7	44.7	36.53	43.2	43.2	198.79	0	0	25.88
40517.65	39.61	39.61	34.7	41.6	41.6	208.22	0	0	23.96
40517.67	36.01	36.01	32.3	38.4	38.4	217.39	0	0	22.15
40517.69	33.48	33.48	29.4	35.2	35.2	217.64	0	0	20.07
40517.71	31.37	31.37	30.22	35.2	35.2	205.58	0	0	18.27
40517.73	30.1	30.1	27.96	32.8	32.8	185.07	0	0	16.64
40517.75	29.26	29.26	25.44	30.4	30.4	165.11	0	0	15.28
40517.77	28.42	28.42	24.74	30.4	30.4	150.16	0	0	14.02
40517.79	27.57	27.57	23.86	28.8	28.8	140.52	0	0	13.14
40517.81	26.73	26.73	23.55	28	28	133.52	0	0	12.37
40517.83	26.31	26.31	21.72	25.6	25.6	127.13	0	0	11.84
40517.85	25.46	25.46	22.3	26.4	26.4	121.01	0	0	11.32
40517.88	24.2	24.2	20.52	24.8	24.8	114.55	0	0	10.76
40517.9	23.77	23.77	18.47	24	24	107.96	0	0	10.17
40517.92	23.35	23.35	17.77	23.36	23.36	103.26	0	0	9.78
40517.94	22.93	22.93	16.5	22.72	22.72	98.69	0	0	9.25
40517.96	22.51	22.51	16.24	22.72	22.72	93.76	0	0	8.89
40517.98	21.66	21.66	14.71	21.44	21.44	88.51	0	0	8.65
40518	20.82	20.82	13.73	20.8	20.8	83.76	0	0	8.46
40518.02	20.4	20.4	13.16	20.16	20.16	79.24	0	0	8.32
40518.04	19.98	19.98	12.58	18.88	18.88	75.32	0	0	8.05
40518.06	19.55	19.55	12.79	20.16	20.16	72.44	0	0	7.74
40518.08	19.55	19.55	12.84	20.16	20.16	70.93	0	0	7.45
40518.1	19.13	19.13	11.32	18.88	18.88	70.81	0	0	7.31
40518.13	18.71	18.71	11.11	18.88	18.88	69.8	0	0	7.3
40518.15	17.87	17.87	9.67	16.96	16.96	67.36	0	0	7.4
40518.17	17.44	17.44	9.32	16.32	16.32	64.94	0	0	7.84
40518.19	17.02	17.02	9.96	17.6	17.6	63.23	0	0	11.18
40518.21	17.02	17.02	9.64	16.96	16.96	62.43	0	0	13.74
40518.23	17.02	17.02	8.82	16.32	16.32	60.62	0	0	14.34
40518.25	16.34	16.34	8.34	15.68	15.68	57.7	0	0	13.7
40518.27	16.09	16.09	8.07	15.68	15.68	54.36	0	0	12.91
40518.29	15.83	15.83	8.45	15.68	15.68	51.63	0	0	11.93
40518.31	15.83	15.83	7.93	15.04	15.04	49.39	0	0	11.3
40518.33	15.57	15.57	8.04	15.04	15.04	47.49	0	0	10.43
40518.35	15.31	15.31	8.27	14.4	14.4	45.62	0	0	9.8
40518.38	15.31	15.31	9.36	13.76	13.76	43.76	0	0	9.7
40518.4	15.06	15.06	10.03	13.76	13.76	42.24	0	0	9.37
40518.42	15.06	15.06	10.12	13.12	13.12	41.2	0	0	8.91
40518.44	14.8	14.8	12.15	15.04	15.04	40.18	0	0	8.42
40518.46	14.8	14.8	11.68	14.4	14.4	39.43	0	0	7.99
40518.48	14.8	14.8	11.82	13.76	13.76	39.43	0	0	7.56
40518.5	15.06	15.06	13.17	13.76	13.76	40.73	0	0	7.24
40518.52	15.31	15.31	14.7	14.4	14.4	48.15	0	0	7.65
40518.54	15.57	15.57	16.6	14.4	14.4	58.24	0	0	9.62
40518.56	17.02	17.02	21.04	15.04	15.04	64.59	0	0	11.42
40518.58	22.09	22.09	21.5	16.32	16.32	65.27	0	0	12.9
40518.6	23.77	23.77	23.12	17.6	17.6	64.57	0	0	13.85
40518.63	24.62	24.62	25.92	18.24	18.24	64.5	0	0	14.27
40518.65	25.04	25.04	24.1	17.6	17.6	66.36	0	0	14.17
40518.67	25.46	25.46	22.46	19.52	19.52	69.6	0	0	13.66
40518.69	29.68	29.68	23.78	20.16	20.16	72.22	0	0	12.68
40518.71	30.53	30.53	25.36	21.44	21.44	74.62	0	0	11.87
40518.73	29.26	29.26	22.32	21.44	21.44	76.69	0	0	11.05
40518.75	27.15	27.15	20.02	20.8	20.8	77.92	0	0	10.34

40518.77	25.46	25.46	19.71	20.8	20.8	78.34	0	0	9.72
40518.79	24.2	24.2	19.29	20.8	20.8	78.51	0	0	9.19
40518.81	22.93	22.93	18.19	20.16	20.16	78.83	0	0	8.78
40518.83	22.09	22.09	16.15	18.88	18.88	79.88	0	0	9.05
40518.85	21.24	21.24	19.18	19.52	19.52	80.72	0	0	9.14
40518.88	21.66	21.66	20.62	19.52	19.52	79.47	0	0	9.25
40518.9	21.66	21.66	19.19	18.88	18.88	77.2	0	0	9.25
40518.92	22.09	22.09	21.8	20.16	20.16	75.96	0	0	9.41
40518.94	22.93	22.93	25.45	20.16	20.16	76.29	0	0	9.79
40518.96	24.62	24.62	26.15	20.8	20.8	77.99	0	0	9.77
40518.98	26.73	26.73	22.07	20.16	20.16	79.61	0	0	9.38
40519	30.53	30.53	22.28	21.44	21.44	80.49	0	0	8.97
40519.02	30.95	30.95	23.96	21.44	21.44	80.49	0	0	8.53
40519.04	30.53	30.53	23.83	22.72	22.72	82.37	0	0	8.21
40519.06	28.84	28.84	20.06	21.44	21.44	86.22	0	0	10.55
40519.08	27.99	27.99	23.71	22.72	22.72	89.12	0	0	12.05
40519.1	27.57	27.57	24.92	22.72	22.72	90.19	0	0	12.8
40519.13	27.99	27.99	25.5	22.08	22.08	90.69	0	0	12.5
40519.15	28.84	28.84	27.94	23.36	23.36	91.53	0	0	12.09
40519.17	29.68	29.68	26.74	24	24	93.25	0	0	11.37
40519.19	30.53	30.53	25.18	24	24	94.58	0	0	11.85
40519.21	30.53	30.53	25.51	24.8	24.8	94.05	0	0	12.38
40519.23	30.1	30.1	24.11	24.8	24.8	92.26	0	0	12.44
40519.25	29.26	29.26	23.57	24	24	90.12	0	0	11.83
40519.27	28.42	28.42	22.69	24	24	88.62	0	0	12.76
40519.29	27.15	27.15	22.02	24	24	88.09	0	0	16
40519.31	26.73	26.73	19.89	22.72	22.72	87.76	0	0	19.34
40519.33	26.31	26.31	19.36	22.72	22.72	86.73	0	0	19.94
40519.35	26.31	26.31	20.06	24	24	86.77	0	0	19.1
40519.38	25.88	25.88	20.42	22.08	22.08	86.9	0	0	17.81
40519.4	25.46	25.46	24.18	22.72	22.72	84.98	0	0	16.85
40519.42	25.88	25.88	28.74	23.36	23.36	82.28	0	0	15.96
40519.44	27.57	27.57	30.48	23.36	23.36	80.71	0	0	15.24
40519.46	35.59	35.59	28.92	24	24	80.45	0	0	14.68
40519.48	51.06	51.06	27.51	24	24	81.31	0	0	14.07
40519.5	59.96	59.96	30.39	27.2	27.2	81.94	0	0	13.19
40519.52	56.14	56.14	28.16	27.2	27.2	82.8	0	0	12.37
40519.54	47.24	47.24	24.76	25.6	25.6	84.33	0	0	12.08
40519.56	40.88	40.88	23.72	25.6	25.6	86.78	0	0	13.84
40519.58	37.28	37.28	24.84	27.2	27.2	90.57	0	0	14.58
40519.6	36.01	36.01	22	24.8	24.8	95.95	0	0	14.15
40519.63	34.32	34.32	20.76	24	24	102.55	0	0	13.05
40519.65	32.64	32.64	20.43	24	24	107.52	0	0	12.02
40519.67	32.64	32.64	19.5	22.72	22.72	108.25	0	0	11.02
40519.69	33.06	33.06	19.81	22.72	22.72	102.89	0	0	10.48
40519.71	33.06	33.06	20.93	24	24	94.81	0	0	9.98
40519.73	32.64	32.64	20.23	23.36	23.36	88.31	0	0	9.89
40519.75	31.37	31.37	23.6	22.72	22.72	84.39	0	0	9.83
40519.77	31.37	31.37	25.83	22.72	22.72	82.06	0	0	9.75
40519.79	31.37	31.37	30.98	23.36	23.36	83.09	0	0	9.41
40519.81	33.9	33.9	31.43	24	24	86.97	0	0	9.15
40519.83	44.7	44.7	29.46	25.6	25.6	93.58	0	0	9.07
40519.85	49.78	49.78	26.77	24.8	24.8	101	0	0	9.35
40519.88	48.51	48.51	26.35	24	24	108.95	0	0	9.48
40519.9	42.79	42.79	24.87	24	24	112.8	0	0	9.52
40519.92	38.97	38.97	26.5	25.6	25.6	113.22	0	0	9.58

40519.94	36.86	36.86	26.74	25.6	25.6	112.74	0	0	9.8
40519.96	35.59	35.59	25.98	24.8	24.8	114.33	0	0	10.23
40519.98	34.32	34.32	23.45	24	24	116.83	0	0	10.55
40520	33.48	33.48	24.34	24	24	119.5	0	0	10.51
40520.02	32.21	32.21	25.46	24	24	121.06	0	0	11.2
40520.04	31.37	31.37	25.85	24	24	119.23	0	0	12.32
40520.06	30.53	30.53	25.85	24	24	115.37	0	0	12.9
40520.08	30.53	30.53	26.04	22.72	22.72	110.45	0	0	13.33
40520.1	30.95	30.95	29.9	24	24	106.19	0	0	13.83
40520.13	31.79	31.79	32.17	24.8	24.8	102.27	0	0	14.17
40520.15	32.21	32.21	30.64	25.6	25.6	98.47	0	0	13.99
40520.17	33.06	33.06	27.72	25.6	25.6	94.96	0	0	13.3
40520.19	32.64	32.64	26.38	26.4	26.4	92.25	0	0	12.37
40520.21	32.21	32.21	23.22	24	24	90.4	0	0	11.51
40520.23	30.95	30.95	22.91	24.8	24.8	88.97	0	0	10.75
40520.25	29.68	29.68	21.34	23.36	23.36	87.92	0	0	10.09
40520.27	28.84	28.84	21.76	23.36	23.36	86.51	0	0	9.48
40520.29	27.57	27.57	21.8	24	24	84.41	0	0	8.93
40520.31	26.73	26.73	19.59	22.72	22.72	81.66	0	0	8.43
40520.33	26.31	26.31	21.49	22.72	22.72	78.73	0	0	7.98
40520.35	26.31	26.31	21.89	22.08	22.08	75.61	0	0	7.56
40520.38	26.73	26.73	21.3	22.08	22.08	72.71	0	0	7.19
40520.4	26.73	26.73	21.03	22.08	22.08	70.18	0	0	6.85
40520.42	27.15	27.15	20.21	21.44	21.44	68.1	0	0	6.55
40520.44	26.73	26.73	19.53	21.44	21.44	65.94	0	0	6.26
40520.46	26.31	26.31	18.95	21.44	21.44	63.88	0	0	6.01
40520.48	25.88	25.88	18.16	21.44	21.44	62.03	0	0	5.77
40520.5	25.46	25.46	17.33	20.8	20.8	60.68	0	0	5.56
40520.52	25.04	25.04	17.24	20.8	20.8	59.58	0	0	5.36
40520.54	24.62	24.62	16.32	20.16	20.16	58.57	0	0	5.18
40520.56	24.2	24.2	15.59	20.16	20.16	57.28	0	0	5.02
40520.58	23.35	23.35	15.77	21.44	21.44	55.7	0	0	4.86
40520.6	22.93	22.93	14.6	20.8	20.8	53.85	0	0	4.72
40520.63	22.51	22.51	13.58	20.16	20.16	51.95	0	0	4.59
40520.65	22.09	22.09	12.8	20.16	20.16	50.1	0	0	4.47
40520.67	21.66	21.66	12.41	20.16	20.16	48.53	0	0	4.36
40520.69	20.82	20.82	11.56	18.88	18.88	47.25	0	0	4.26
40520.71	20.4	20.4	11.14	18.88	18.88	46.1	0	0	4.17
40520.73	22.51	22.51	10.27	17.6	17.6	44.82	0	0	4.08
40520.75	20.82	20.82	10.13	17.6	17.6	43.39	0	0	4
40520.77	19.55	19.55	10.01	17.6	17.6	42.01	0	0	3.92
40520.79	19.13	19.13	10.4	18.88	18.88	40.96	0	0	3.85
40520.81	18.71	18.71	9.87	17.6	17.6	40.02	0	0	3.8
40520.83	18.71	18.71	10.02	16.96	16.96	39.02	0	0	3.78
40520.85	18.71	18.71	10.94	17.6	17.6	38.49	0	0	3.79
40520.88	18.29	18.29	10.88	16.96	16.96	38.19	0	0	3.84
40520.9	17.87	17.87	10.61	16.96	16.96	38.23	0	0	3.92
40520.92	17.87	17.87	10.2	16.96	16.96	38.3	0	0	4.04
40520.94	17.87	17.87	10.43	17.6	17.6	38.4	0	0	4.12
40520.96	17.87	17.87	10.12	16.32	16.32	38.61	0	0	4.14
40520.98	17.87	17.87	9.75	15.68	15.68	39.13	0	0	4.11
40521	17.44	17.44	9.9	15.68	15.68	40.07	0	0	4.08
40521.02	17.02	17.02	10.22	15.04	15.04	40.08	0	0	4.08
40521.04	16.6	16.6	10.6	15.68	15.68	39.45	0	0	4.15
40521.06	16.6	16.6	10.09	16.32	16.32	38.46	0	0	4.25
40521.08	16.34	16.34	9.23	15.04	15.04	37.36	0	0	4.32

40521.1	16.34	16.34	8.79	14.4	14.4	35.99	0	0	4.31
40521.13	16.09	16.09	8.23	13.76	13.76	34.71	0	0	4.23
40521.15	16.09	16.09	8.3	13.76	13.76	33.79	0	0	4.12
40521.17	16.09	16.09	8.73	15.04	15.04	32.99	0	0	4.03
40521.19	15.83	15.83	8.56	15.04	15.04	32.1	0	0	3.96
40521.21	15.83	15.83	8.33	15.04	15.04	31.02	0	0	3.91
40521.23	15.83	15.83	7.75	14.4	14.4	29.9	0	0	3.88
40521.25	15.31	15.31	7.3	13.12	13.12	29.01	0	0	3.89
40521.27	15.31	15.31	7.22	13.12	13.12	28.59	0	0	3.9
40521.29	15.06	15.06	7.06	12.48	12.48	28.48	0	0	3.9
40521.31	15.06	15.06	6.97	12.48	12.48	28.26	0	0	3.87
40521.33	14.8	14.8	7.08	13.12	13.12	27.58	0	0	3.82
40521.35	14.8	14.8	6.91	13.12	13.12	26.44	0	0	3.76
40521.38	14.54	14.54	6.76	13.12	13.12	25.16	0	0	3.69
40521.4	14.54	14.54	6.57	13.12	13.12	24.09	0	0	3.63
40521.42	14.28	14.28	6.32	12.48	12.48	23.36	0	0	3.58
40521.44	14.28	14.28	6.25	12.48	12.48	22.89	0	0	3.53
40521.46	14.28	14.28	6.08	11.84	11.84	22.61	0	0	3.48
40521.48	14.03	14.03	5.91	11.2	11.2	22.36	0	0	3.44
40521.5	13.77	13.77	5.98	11.84	11.84	21.97	0	0	3.39
40521.52	13.51	13.51	5.96	11.84	11.84	21.37	0	0	3.35
40521.54	13.51	13.51	5.96	12.48	12.48	20.69	0	0	3.32
40521.56	13.25	13.25	5.87	12.48	12.48	20.01	0	0	3.28
40521.58	13.25	13.25	5.64	11.84	11.84	19.38	0	0	3.25
40521.6	13.25	13.25	5.59	11.84	11.84	18.9	0	0	3.22
40521.63	13	13	5.54	11.84	11.84	18.67	0	0	3.19
40521.65	13	13	5.51	11.84	11.84	18.58	0	0	3.17
40521.67	12.74	12.74	5.54	12.48	12.48	18.43	0	0	3.14
40521.69	12.74	12.74	5.33	11.2	11.2	18.1	0	0	3.12
40521.71	12.74	12.74	5.22	10.56	10.56	17.67	0	0	3.1
40521.73	12.74	12.74	5.17	10.56	10.56	17.29	0	0	3.08
40521.75	12.48	12.48	5.23	11.2	11.2	17.05	0	0	3.06
40521.77	12.22	12.22	5.22	11.2	11.2	16.85	0	0	3.04
40521.79	12.22	12.22	5.09	9.92	9.92	16.5	0	0	3.02
40521.81	12.22	12.22	5.09	10.56	10.56	15.89	0	0	3
40521.83	12.22	12.22	5.06	9.92	9.92	15.27	0	0	2.99
40521.85	12.22	12.22	5.09	10.56	10.56	14.94	0	0	2.97
40521.88	11.97	11.97	5.09	10.56	10.56	14.87	0	0	2.96
40521.9	11.71	11.71	5.01	9.92	9.92	14.68	0	0	2.94
40521.92	11.71	11.71	5.01	9.92	9.92	14.21	0	0	2.93
40521.94	11.71	11.71	5	9.92	9.92	13.73	0	0	2.92
40521.96	11.71	11.71	5	9.92	9.92	13.58	0	0	2.91
40521.98	11.71	11.71	4.96	9.92	9.92	13.6	0	0	2.89
40522	11.45	11.45	4.94	9.92	9.92	13.49	0	0	2.88
40522.02	11.45	11.45	4.91	9.92	9.92	13.14	0	0	2.87
40522.04	11.19	11.19	4.84	9.28	9.28	12.75	0	0	2.86
40522.06	11.19	11.19	4.79	8.64	8.64	12.5	0	0	2.85
40522.08	11.19	11.19	4.85	9.92	9.92	12.42	0	0	2.84
40522.1	11.19	11.19	4.78	8.64	8.64	12.37	0	0	2.84
40522.13	10.94	10.94	4.82	9.92	9.92	12.21	0	0	2.83
40522.15	10.94	10.94	4.81	9.92	9.92	11.88	0	0	2.82
40522.17	10.94	10.94	4.79	9.28	9.28	11.47	0	0	2.81
40522.19	10.68	10.68	4.79	8.64	8.64	11.14	0	0	2.8
40522.21	10.94	10.94	4.89	9.28	9.28	11.05	0	0	2.8
40522.23	10.68	10.68	4.83	8.64	8.64	11.14	0	0	2.79
40522.25	10.42	10.42	4.76	8	8	11.2	0	0	2.78

40522.27	10.42	10.42	4.75	8	8	11.09	0	0	2.78
40522.29	10.42	10.42	4.75	8	8	10.77	0	0	2.77
40522.31	10.17	10.17	4.72	7.65	7.65	10.34	0	0	2.76
40522.33	10.17	10.17	4.74	8	8	9.97	0	0	2.76
40522.35	10.17	10.17	4.72	8	8	9.68	0	0	2.75
40522.38	10.17	10.17	4.68	7.65	7.65	9.32	0	0	2.75
40522.4	9.91	9.91	4.72	8.64	8.64	8.9	0	0	2.74
40522.42	9.91	9.91	4.7	8.64	8.64	8.65	0	0	2.74
40522.44	9.91	9.91	4.67	8.64	8.64	8.55	0	0	2.73
40522.46	9.65	9.65	4.6	7.65	7.65	8.5	0	0	2.73
40522.48	9.65	9.65	4.6	8	8	8.49	0	0	2.72
40522.5	9.65	9.65	4.6	8	8	8.57	0	0	2.72
40522.52	9.65	9.65	4.6	8	8	8.69	0	0	2.71
40522.54	9.65	9.65	4.61	8.64	8.64	8.73	0	0	2.71
40522.56	8.23	-99	4.58	8.43	-99	8.54	0	-99	2.71
40522.58	7.75	-99	4.56	8.24	-99	8.16	0	-99	2.7
40522.6	8.07	-99	4.54	8.07	-99	7.9	0	-99	2.7
40522.63	7.76	-99	4.52	7.93	-99	7.92	0	-99	2.69
40522.65	8.01	-99	4.51	7.8	-99	8.03	0	-99	2.69
40522.67	7.78	-99	4.51	7.69	-99	8.02	0	-99	2.69
40522.69	7.95	-99	4.5	7.59	-99	7.76	0	-99	2.68
40522.71	7.78	-99	4.49	7.5	-99	7.19	0	-99	2.68
40522.73	7.91	-99	4.48	7.42	-99	6.44	0	-99	2.68
40522.75	7.78	-99	4.47	7.36	-99	5.88	0	-99	2.67
40522.77	7.87	-99	4.46	7.3	-99	5.69	0	-99	2.67
40522.79	7.77	-99	4.46	7.24	-99	5.69	0	-99	2.67
40522.81	7.84	-99	4.45	7.19	-99	5.64	0	-99	2.66
40522.83	7.76	-99	4.44	7.15	-99	5.49	0	-99	2.66
40522.85	7.81	-99	4.43	7.12	-99	5.38	0	-99	2.66
40522.88	7.75	-99	4.43	7.08	-99	5.32	0	-99	2.65
40522.9	7.78	-99	4.42	7.05	-99	5.26	0	-99	2.65
40522.92	7.74	-99	4.41	7.03	-99	5.18	0	-99	2.65
40522.94	7.76	-99	4.41	7	-99	5.12	0	-99	2.64
40522.96	7.73	-99	4.4	6.98	-99	5.07	0	-99	2.64
40522.98	7.74	-99	4.39	6.96	-99	5.02	0	-99	2.64
40523	7.71	-99	4.39	6.94	-99	4.98	0	-99	2.64
40523.02	7.72	-99	4.38	6.93	-99	4.94	0	-99	2.63
40523.04	7.7	-99	4.38	6.91	-99	4.9	0	-99	2.63
40523.06	7.7	-99	4.37	6.9	-99	4.87	0	-99	2.63
40523.08	7.69	-99	4.37	6.88	-99	4.84	0	-99	2.63
40523.1	7.69	-99	4.36	6.87	-99	4.81	0	-99	2.62
40523.13	7.67	-99	4.36	6.86	-99	4.78	0	-99	2.62
40523.15	7.67	-99	4.35	6.85	-99	4.76	0	-99	2.62
40523.17	7.66	-99	4.35	6.84	-99	4.73	0	-99	2.62
40523.19	7.66	-99	4.34	6.83	-99	4.71	0	-99	2.61
40523.21	7.64	-99	4.34	6.83	-99	4.69	0	-99	2.61
40523.23	7.64	-99	4.33	6.82	-99	4.67	0	-99	2.61
40523.25	7.63	-99	4.33	6.81	-99	4.66	0	-99	2.61
40523.27	7.63	-99	4.32	6.8	-99	4.64	0	-99	2.6
40523.29	7.62	-99	4.32	6.8	-99	4.62	0	-99	2.6
40523.31	7.61	-99	4.31	6.79	-99	4.61	0	-99	2.6
40523.33	7.6	-99	4.31	6.78	-99	4.59	0	-99	2.6
40523.35	7.6	-99	4.3	6.78	-99	4.58	0	-99	2.6
40523.38	7.59	-99	4.3	6.77	-99	4.57	0	-99	2.59
40523.4	7.59	-99	4.3	6.77	-99	4.55	0	-99	2.59
40523.42	7.58	-99	4.29	6.76	-99	4.54	0	-99	2.59

40523.44	7.57	-99	4.29	6.76	-99	4.53	0	-99	2.59
40523.46	7.57	-99	4.28	6.75	-99	4.52	0	-99	2.58
40523.48	7.56	-99	4.28	6.75	-99	4.51	0	-99	2.58
40523.5	7.55	-99	4.28	6.74	-99	4.5	0	-99	2.58
40523.52	7.55	-99	4.27	6.74	-99	4.49	0	-99	2.58
40523.54	7.54	-99	4.27	6.73	-99	4.48	0	-99	2.58
40523.56	7.54	-99	4.26	6.73	-99	4.47	0	-99	2.57
40523.58	7.53	-99	4.26	6.72	-99	4.46	0	-99	2.57
40523.6	7.53	-99	4.26	6.72	-99	4.45	0	-99	2.57
40523.63	7.52	-99	4.25	6.72	-99	4.44	0	-99	2.57
40523.65	7.51	-99	4.25	6.71	-99	4.44	0	-99	2.57
40523.67	7.51	-99	4.25	6.71	-99	4.43	0	-99	2.56
40523.69	7.5	-99	4.24	6.7	-99	4.42	0	-99	2.56
40523.71	7.5	-99	4.24	6.7	-99	4.41	0	-99	2.56
40523.73	7.49	-99	4.23	6.7	-99	4.4	0	-99	2.56
40523.75	7.49	-99	4.23	6.69	-99	4.4	0	-99	2.56
40523.77	7.48	-99	4.23	6.69	-99	4.39	0	-99	2.55
40523.79	7.47	-99	4.22	6.68	-99	4.38	0	-99	2.55
40523.81	7.47	-99	4.22	6.68	-99	4.38	0	-99	2.55
40523.83	7.46	-99	4.22	6.68	-99	4.37	0	-99	2.55
40523.85	7.46	-99	4.21	6.67	-99	4.36	0	-99	2.55
40523.88	7.45	-99	4.21	6.67	-99	4.36	0	-99	2.54
40523.9	7.45	-99	4.21	6.67	-99	4.35	0	-99	2.54
40523.92	7.44	-99	4.2	6.66	-99	4.34	0	-99	2.54
40523.94	7.44	-99	4.2	6.66	-99	4.34	0	-99	2.54
40523.96	7.43	-99	4.2	6.66	-99	4.33	0	-99	2.54
40523.98	7.42	-99	4.19	6.65	-99	4.33	0	-99	2.54
40524	7.42	-99	4.19	6.65	-99	4.32	0	-99	2.53
40524.02	7.41	-99	4.19	6.65	-99	4.31	0	-99	2.53
40524.04	7.41	-99	4.19	6.64	-99	4.31	0	-99	2.53
40524.06	7.4	-99	4.18	6.64	-99	4.3	0	-99	2.53
40524.08	7.4	-99	4.18	6.64	-99	4.3	0	-99	2.53
40524.1	7.39	-99	4.18	6.63	-99	4.29	0	-99	2.52
40524.13	7.39	-99	4.17	6.63	-99	4.29	0	-99	2.52
40524.15	7.38	-99	4.17	6.63	-99	4.28	0	-99	2.52
40524.17	7.38	-99	4.17	6.62	-99	4.28	0	-99	2.52
40524.19	7.37	-99	4.16	6.62	-99	4.27	0	-99	2.52
40524.21	7.37	-99	4.16	6.62	-99	4.27	0	-99	2.52
40524.23	7.36	-99	4.16	6.61	-99	4.26	0	-99	2.51
40524.25	7.36	-99	4.15	6.61	-99	4.26	0	-99	2.51
40524.27	7.35	-99	4.15	6.61	-99	4.25	0	-99	2.51
40524.29	7.35	-99	4.15	6.6	-99	4.25	0	-99	2.51
40524.31	7.34	-99	4.15	6.6	-99	4.24	0	-99	2.51
40524.33	7.34	-99	4.14	6.6	-99	4.24	0	-99	2.51
40524.35	7.33	-99	4.14	6.59	-99	4.23	0	-99	2.5
40524.38	7.33	-99	4.14	6.59	-99	4.23	0	-99	2.5
40524.4	7.32	-99	4.13	6.59	-99	4.23	0	-99	2.5
40524.42	7.32	-99	4.13	6.59	-99	4.22	0	-99	2.5
40524.44	7.31	-99	4.13	6.58	-99	4.22	0	-99	2.5
40524.46	7.31	-99	4.13	6.58	-99	4.21	0	-99	2.49
40524.48	7.3	-99	4.12	6.58	-99	4.21	0	-99	2.49
40524.5	7.3	-99	4.12	6.57	-99	4.2	0	-99	2.49
40524.52	7.29	-99	4.12	6.57	-99	4.2	0	-99	2.49
40524.54	7.29	-99	4.11	6.57	-99	4.2	0	-99	2.49
40524.56	7.28	-99	4.11	6.56	-99	4.19	0	-99	2.49
40524.58	7.28	-99	4.11	6.56	-99	4.19	0	-99	2.48

40524.6	7.27	-99	4.11	6.56	-99	4.18	0	-99	2.48
40524.63	7.27	-99	4.1	6.56	-99	4.18	0	-99	2.48
40524.65	7.26	-99	4.1	6.55	-99	4.18	0	-99	2.48
40524.67	7.26	-99	4.1	6.55	-99	4.17	0	-99	2.48
40524.69	7.25	-99	4.09	6.55	-99	4.17	0	-99	2.48
40524.71	7.25	-99	4.09	6.54	-99	4.17	0	-99	2.47
40524.73	7.24	-99	4.09	6.54	-99	4.16	0	-99	2.47
40524.75	7.24	-99	4.09	6.54	-99	4.16	0	-99	2.47
40524.77	7.23	-99	4.08	6.54	-99	4.15	0	-99	2.47
40524.79	7.23	-99	4.08	6.53	-99	4.15	0	-99	2.47
40524.81	7.22	-99	4.08	6.53	-99	4.15	0	-99	2.47
40524.83	7.22	-99	4.07	6.53	-99	4.14	0	-99	2.46
40524.85	7.22	-99	4.07	6.52	-99	4.14	0	-99	2.46
40524.88	7.21	-99	4.07	6.52	-99	4.14	0	-99	2.46
40524.9	7.21	-99	4.07	6.52	-99	4.13	0	-99	2.46
40524.92	7.2	-99	4.06	6.52	-99	4.13	0	-99	2.46
40524.94	7.2	-99	4.06	6.51	-99	4.13	0	-99	2.46
40524.96	7.19	-99	4.06	6.51	-99	4.12	0	-99	2.46
40524.98	7.19	-99	4.06	6.51	-99	4.12	0	-99	2.45
40525	7.18	-99	4.05	6.51	-99	4.12	0	-99	2.45
40525.02	7.18	-99	4.05	6.5	-99	4.11	0	-99	2.45
40525.04	7.17	-99	4.05	6.5	-99	4.11	0	-99	2.45
40525.06	7.17	-99	4.04	6.5	-99	4.11	0	-99	2.45
40525.08	7.16	-99	4.04	6.49	-99	4.1	0	-99	2.45
40525.1	7.16	-99	4.04	6.49	-99	4.1	0	-99	2.44
40525.13	7.15	-99	4.04	6.49	-99	4.1	0	-99	2.44
40525.15	7.15	-99	4.03	6.49	-99	4.09	0	-99	2.44
40525.17	7.14	-99	4.03	6.48	-99	4.09	0	-99	2.44
40525.19	7.14	-99	4.03	6.48	-99	4.09	0	-99	2.44
40525.21	7.14	-99	4.03	6.48	-99	4.08	0	-99	2.44
40525.23	7.13	-99	4.02	6.48	-99	4.08	0	-99	2.43
40525.25	7.13	-99	4.02	6.47	-99	4.08	0	-99	2.43
40525.27	7.12	-99	4.02	6.47	-99	4.07	0	-99	2.43
40525.29	7.12	-99	4.02	6.47	-99	4.07	0	-99	2.43
40525.31	7.11	-99	4.01	6.46	-99	4.07	0	-99	2.43
40525.33	7.11	-99	4.01	6.46	-99	4.06	0	-99	2.43
40525.35	7.1	-99	4.01	6.46	-99	4.06	0	-99	2.42
40525.38	7.1	-99	4	6.46	-99	4.06	0	-99	2.42
40525.4	7.09	-99	4	6.45	-99	4.06	0	-99	2.42
40525.42	7.09	-99	4	6.45	-99	4.05	0	-99	2.42
40525.44	7.08	-99	4	6.45	-99	4.05	0	-99	2.42
40525.46	7.08	-99	3.99	6.45	-99	4.05	0	-99	2.42
40525.48	7.08	-99	3.99	6.44	-99	4.04	0	-99	2.42
40525.5	7.07	-99	3.99	6.44	-99	4.04	0	-99	2.41
40525.52	7.07	-99	3.99	6.44	-99	4.04	0	-99	2.41
40525.54	7.06	-99	3.98	6.44	-99	4.03	0	-99	2.41

PARAMETER data
NERANG RIVER (no forecast rainfall)
RUN DATED Fri Dec 10 2010 13:30 - FORECAST RUN FROM Wed Dec 01 2010 09:00
MODEL PARAMETERS: alpha=0.1500 m=0.80 beta= 4.00 IL= 15.0 CL= 1.00 dt=0.50h L_NERANG=-35.7 HINZE

HINZE_DA	CLEARVIE\	CLEARVIEW	(R)
94.5	0.35	0.35	
94.5	0.35	0.35	
94.5	0.35	0.35	
94.5	0.35	0.35	
94.5	0.35	0.35	

94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.35	0.35
94.5	0.36	0.35
94.5	0.36	0.35
94.5	0.37	0.35
94.5	0.37	0.35
94.5	0.37	0.35
94.5	0.37	0.35
94.5	0.37	0.35
94.5	0.37	0.35
94.5	0.37	0.35
94.5	0.37	0.35
94.5	0.37	0.35
94.5	0.37	0.35
94.5	0.37	0.35
94.5	0.37	0.35
94.5	0.37	0.35
94.5	0.37	0.35
94.5	0.37	0.35
94.5	0.36	0.35
94.5	0.36	0.35
94.5	0.36

94.5	0.37	0.35
94.5	0.38	0.35
94.5	0.38	0.37
94.5	0.39	0.39
94.5	0.4	0.4
94.5	0.41	0.4
94.5	0.41	0.4
94.5	0.4	0.45
94.5	0.4	0.44
94.5	0.4	0.43
94.5	0.4	0.42
94.5	0.41	0.4
94.5	0.43	0.4
94.5	0.51	0.4
94.5	0.56	0.4
94.5	0.64	0.4
94.5	0.7	0.4
94.5	0.72	0.4
94.5	0.71	0.4
94.5	0.69	0.4
94.5	0.67	0.4
94.5	0.66	0.4
94.5	0.64	0.4
94.5	0.63	0.4
94.5	0.62	0.4
94.5	0.61	0.4
94.5	0.6	0.4
94.5	0.59	0.4
94.5	0.58	0.4
94.5	0.57	0.4
94.5	0.57	0.4
94.5	0.56	0.4
94.5	0.55	0.38
94.5	0.55	0.37
94.5	0.55	0.36
94.5	0.55	0.35
94.5	0.55	0.35
94.5	0.55	0.35
94.5	0.54	0.35
94.5	0.54	0.35
94.5	0.54	0.35
94.5	0.54	0.35
94.5	0.54	0.35
94.5	0.56	0.35
94.5	0.58	0.36
94.5	0.6	0.37
94.5	0.62	0.38
94.5	0.62	0.4
94.5	0.63	0.66
94.5	0.65	1.03
94.5	0.68	1.15
94.5	0.73	1.19
94.5	0.76	1.2
94.5	0.78	1.2
94.5	0.77	1.2
94.5	0.74	1.2

94.5	0.73	1.22
94.5	0.73	1.24
94.5	0.72	1.25
94.5	0.71	1.25
94.5	0.7	1.25
94.5	0.68	1.25
94.5	0.67	1.25
94.5	0.65	1.25
94.5	0.64	1.25
94.5	0.63	1.25
94.5	0.62	1.25
94.5	0.61	1.25
94.5	0.6	1.25
94.5	0.59	1.25
94.5	0.59	1.25
94.5	0.59	1.25
94.5	0.58	1.25
94.5	0.58	1.25
94.5	0.58	1.25
94.5	0.57	1.25
94.5	0.57	1.25
94.5	0.56	1.25
94.5	0.56	1.25
94.5	0.55	1.25
94.5	0.55	1.25
94.5	0.55	1.25
94.5	0.54	1.25
94.5	0.55	1.25
94.5	0.55	1.25
94.5	0.56	1.25
94.5	0.66	1.25
94.5	0.76	1.25
94.5	0.83	1.25
94.5	0.86	1.25
94.5	0.9	1.25
94.5	1.02	1.28
94.5	1.07	1.32
94.5	1.13	1.34
94.5	1.15	1.36
94.5	1.18	1.38
94.5	1.19	1.4
94.5	1.19	1.4
94.5	1.17	1.4
94.5	1.14	1.4
94.5	1.1	1.4
94.5	1.07	1.4
94.5	1.04	1.4
94.5	1.01	1.39
94.5	0.98	1.37
94.5	0.94	1.35
94.5	0.9	1.35
94.5	0.87	1.35
94.5	0.84	1.35
94.5	0.82	1.36
94.5	0.79	1.38
94.5	0.77	1.4

94.5	0.76	1.48
94.5	0.74	1.56
94.5	0.73	1.6
94.5	0.72	1.61
94.5	0.71	1.63
94.5	0.71	1.65
94.5	0.7	1.65
94.5	0.79	1.65
94.5	0.91	1.65
94.5	0.98	1.66
94.5	1.03	1.69
94.5	1.1	1.72
94.5	1.27	1.75
94.5	1.56	1.83
94.5	1.67	1.95
94.5	1.75	1.96
94.5	1.86	1.99
94.5	1.97	2.03
94.5	2.05	2.09
94.5	2.14	2.18
94.5	2.21	2.32
94.5	2.29	2.4
94.5	2.32	2.4
94.5	2.28	2.4
94.5	2.21	2.4
94.5	2.14	2.4
94.5	2.07	2.4
94.5	2.03	2.41
94.5	1.96	2.46
94.5	1.89	2.5
94.5	1.82	2.52
94.5	1.76	2.53
94.5	1.7	2.55
94.5	1.65	2.55
94.5	1.59	2.56
94.5	1.53	2.57
94.5	1.47	2.58
94.5	1.41	2.59
94.5	1.35	2.6
94.5	1.31	2.61
94.5	1.27	2.64
94.5	1.24	2.65
94.5	1.22	2.65
94.5	1.19	2.65
94.5	1.17	2.65
94.5	1.15	2.65
94.5	1.12	2.65
94.5	1.1	2.65
94.5	1.09	2.65
94.5	1.08	2.65
94.5	1.08	2.65
94.5	1.06	2.65
94.5	1.05	2.65
94.5	1.04	2.65
94.5	1.03	2.65
94.5	1.03	2.65

94.5	1.03	2.65
94.5	1.05	2.67
94.5	1.21	2.71
94.5	1.34	2.75
94.5	1.36	2.75
94.5	1.33	2.75
94.5	1.3	2.75
94.5	1.25	2.74
94.5	1.22	2.72
94.5	1.18	2.7
94.5	1.15	2.7
94.5	1.14	2.7
94.5	1.13	2.7
94.5	1.11	2.7
94.5	1.08	2.71
94.5	1.06	2.72
94.5	1.04	2.73
94.5	1.03	2.75
94.5	1.05	2.75
94.5	1.14	2.77
94.5	1.22	2.83
94.5	1.3	2.88
94.5	1.34	2.9
94.5	1.36	2.9
94.5	1.36	2.9
94.5	1.33	2.89
94.5	1.28	2.87
94.5	1.25	2.85
94.5	1.21	2.83
94.5	1.17	2.8
94.5	1.14	2.8
94.5	1.12	2.8
94.5	1.1	2.78
94.5	1.11	2.76
94.5	1.12	2.75
94.5	1.12	2.75
94.5	1.12	2.75
94.5	1.13	2.75
94.5	1.15	2.76
94.5	1.15	2.77
94.5	1.13	2.78
94.5	1.11	2.79
94.5	1.09	2.8
94.5	1.07	2.8
94.5	1.18	2.82
94.5	1.25	2.84
94.5	1.29	2.85
94.5	1.28	2.85
94.5	1.26	2.85
94.5	1.22	2.8
94.5	1.25	2.8
94.5	1.27	2.8
94.5	1.27	2.8
94.5	1.24	2.8
94.5	1.29	2.8
94.5	1.44	2.82

94.5	1.56	2.9
94.5	1.58	2.94
94.5	1.56	2.93
94.5	1.52	2.91
94.5	1.48	2.9
94.5	1.44	2.88
94.5	1.41	2.85
94.5	1.38	2.85
94.5	1.35	2.85
94.5	1.31	2.85
94.5	1.27	2.85
94.5	1.26	2.82
94.5	1.34	2.89
94.5	1.38	2.95
94.5	1.35	2.94
94.5	1.3	2.92
94.5	1.25	2.91
94.5	1.21	2.9
94.5	1.18	2.9
94.5	1.16	2.9
94.5	1.15	2.9
94.5	1.15	2.9
94.5	1.15	2.9
94.5	1.13	2.89
94.5	1.12	2.85
94.5	1.11	2.85
94.5	1.13	2.85
94.5	1.13	2.85
94.5	1.13	2.85
94.5	1.14	2.85
94.5	1.15	2.86
94.5	1.17	2.87
94.5	1.18	2.88
94.5	1.18	2.89
94.5	1.21	2.9
94.5	1.27	2.91
94.5	1.3	2.95
94.5	1.32	3
94.5	1.34	3.04
94.5	1.36	3.05
94.5	1.35	3.05
94.5	1.31	3.05
94.5	1.27	3.03
94.5	1.23	3.01
94.5	1.19	2.98
94.5	1.16	2.96
94.5	1.13	2.95
94.5	1.11	2.93
94.5	1.08	2.89
94.5	1.06	2.88
94.5	1.04	2.87
94.5	1.02	2.85
94.5	1.01	2.85
94.5	0.99	2.88
94.5	0.96	2.9
94.5	0.94	2.9

94.5	0.92	2.9
94.5	0.9	2.9
94.5	0.88	2.9
94.5	0.86	2.9
94.5	0.85	2.9
94.5	0.84	2.9
94.5	0.82	2.9
94.5	0.81	2.9
94.5	0.8	2.9
94.5	0.79	2.9
94.5	0.78	2.88
94.5	0.77	2.87
94.5	0.77	2.86
94.5	0.76	2.85
94.5	0.75	2.85
94.5	0.75	2.85
94.5	0.74	2.85
94.5	0.74	2.85
94.5	0.74	2.85
94.5	0.74	2.85
94.5	0.75	2.85
94.5	0.76	2.85
94.5	0.77	2.85
94.5	0.77	2.85
94.5	0.77	2.85
94.5	0.77	2.85
94.5	0.77	2.85
94.5	0.77	2.85
94.5	0.78	2.85
94.5	0.79	2.85
94.5	0.79	2.85
94.5	0.78	2.85
94.5	0.77	2.85
94.5	0.76	2.85
94.5	0.76	2.85
94.5	0.75	2.85
94.5	0.75	2.85
94.5	0.75	2.85
94.5	0.75	2.85
94.5	0.75	2.85
94.5	0.75	2.84
94.5	0.74	2.84
94.5	0.74	2.83
94.5	0.73	2.82
94.5	0.73	2.82
94.5	0.72	2.81
94.5	0.72	2.81
94.5	0.71	2.8
94.5	0.71	2.8
94.5	0.7	2.8
94.5	0.7	2.8
94.5	0.7	2.8
94.5	0.7	2.8
94.5	0.69	2.8
94.5	0.69	2.8
94.5	0.69	2.8

94.5	0.68	2.8
94.5	0.68	2.8
94.5	0.68	2.8
94.5	0.68	2.8
94.5	0.68	2.8
94.5	0.67	2.8
94.5	0.67	2.8
94.5	0.67	2.8
94.5	0.67	2.8
94.5	0.67	2.8
94.5	0.67	2.8
94.5	0.67	2.8
94.5	0.66	2.8
94.5	0.66	2.8
94.5	0.66	2.8
94.5	0.66	2.8
94.5	0.66	2.8
94.5	0.66	2.8
94.5	0.66	2.8
94.5	0.66	2.8
94.5	0.66	2.8
94.5	0.66	2.8
94.5	0.65	2.8
94.5	0.65	2.8
94.5	0.65	2.8
94.5	0.65	2.8
94.5	0.65	2.79
94.5	0.65	2.78
94.5	0.65	2.77
94.5	0.65	2.76
94.5	0.65	2.75
94.5	0.65	2.75
94.5	0.65	2.75
94.5	0.65	2.75
94.5	0.65	2.75
94.5	0.65	2.75
94.5	0.65	2.75
94.5	0.65	2.75
94.5	0.65	2.75
94.5	0.65	2.75
94.5	0.64	2.75
94.5	0.64	2.75
94.5	0.64	2.75
94.5	0.64	2.75
-99	0.64	-99
-99	0.64	-99
-99	0.64	-99
-99	0.64	-99
-99	0.64	-99
-99	0.64	-99
-99	0.64	-99
-99	0.64	-99
-99	0.64	-99
-99	0.64	-99
-99	0.64	-99
-99	0.64	-99

-99	0.64	-99
-99	0.64	-99
-99	0.64	-99

-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.63	-99
-99	0.62	-99
-99	0.62	-99
-99	0.62

-99	0.62	-99
-99	0.62	-99
-99	0.62	-99

0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.74
0.8
0.82
0.82
0.82
0.96
0.94
0.91
0.88
0.82
0.82
0.82
0.82
0.82
0.82
0.82
0.82
0.82
0.82
0.82
0.82
0.82
0.82
0.82
0.82
0.82
0.82
0.82

0.82
0.82
0.77
0.74
0.72
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.69
0.72
0.74
0.77
0.82
2.89
7.33
9.85
10.69
10.9
10.9
10.9
10.9
11.32
11.74
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95
11.95

11.95
11.95
11.95
11.95
11.95
12.58
13.42
13.84
14.26
14.68
15.1
15.1
15.1
15.1
15.1
15.1
15.1
14.89
14.47
14.05
14.05
14.05
14.05
14.26
14.68
15.1
16.78
19.18
20.5
20.83
21.49
22.15
22.15
22.15
22.15
22.48
23.47
24.46
25.45
28.09
32.05
32.38
33.37
35.06
37.79
41.87
48.23
51.86
51.86
51.86
51.86
51.86
51.86
52.31
54.58
56.4

57.57
58.15
59.32
59.32
59.9
60.49
61.07
61.66
62.24
62.82
64.58
65.16
65.16
65.16
65.16
65.16
65.16
65.16
65.16
65.16
65.16
65.16
65.16
65.16
65.16
65.16
66.33
68.66
71
71
71
71
70.42
69.25
68.08
68.08
68.08
68.08
68.08
68.08
68.66
69.25
69.83
71
71
72.17
75.67
78.59
79.76
79.76
79.76
79.18
78.01
76.84
75.67
73.92

73.92
73.92
72.75
71.58
71
71
71
71
71.58
72.17
72.75
73.34
73.92
73.92
75.09
76.26
76.84
76.84
76.84
73.92
73.92
73.92
73.92
73.92
73.92
73.92
75.09
79.76
82.1
81.51
80.34
79.76
78.59
76.84
76.84
76.84
76.84
76.84
75.09
79.18
82.68
82.1
80.93
80.34
79.76
79.76
79.76
79.76
79.76
79.76
79.18
76.84
76.84
76.84
76.84
76.84
76.84

77.42
78.01
78.59
79.18
79.76
80.34
82.68
85.6
88.43
89.14
89.14
89.14
87.72
86.31
84.43
83.26
82.68
81.51
79.18
78.59
78.01
76.84
76.84
78.59
79.76
79.76
79.76
79.76
79.76
79.76
79.76
79.76
79.76
79.76
79.76
79.76
78.59
78.01
77.42
76.84
76.84
76.84
76.84
76.84
76.84
76.84
76.84
76.84
76.84
76.84
76.84
76.84
76.84
76.84
76.84

76.84
76.84
76.84
76.84
76.84
76.84
76.84
76.84
76.84
76.84
76.26
76.26
75.67
75.09
75.09
74.5
74.5
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.92
73.34
72.75
72.17
71.58

71
71
71
71
71
71
71
71
71
71
71
71
71
71
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99
-99

-99
-99
-99

-99
-99
-99

From: [redacted]
Sent: Friday, December 10, 2010 4:07 PM
To: [redacted]@qwc.qld.gov.au>
Cc: Mary Boydell <[redacted]; Waldman Karen <[redacted]; Dan Spiller [redacted]
Subject: RE: Recommended draw down of Hinze Dam

[redacted]
Thanks for this – much appreciated
Kind regards

[redacted]
Email [redacted]
Tel. [redacted]
Mob. [redacted]

From: [redacted]
Sent: Friday, 10 December 2010 4:06 PM
To: [redacted]
Cc: Mary Boydell; Waldman Karen; spiller daniel @ SEQWGM; [redacted]
Subject: RE: Recommended draw down of Hinze Dam

[redacted]

IN RESPONSE - YOUR DISCUSSION WITH MARY BOYDELL EARLIER TODAY;

The QWC has considered the request to allow drawdown of Hinze Dam to continue at a rate of 65 cubic metres per second until mid-week to draw down an additional 12,000 ML to assist in allowing construction to be finalised.

Noting that the Water Grid Manager has no concerns and advises that the drawdown will not infringe the risk criteria in the System Operating Plan or the interim operating strategy the Queensland Water Commission also endorses the action.

It is noted also that such releases are an operational matter for Seqwater, within the context of the Resource Operations Plan, where there is no condition in the System Operating Plan that regulates releases from Hinze Dam. It is recommended that Seqwater liaise with the Department of Environment and Resource Management to confirm their understanding of any conditions that apply.

It is suggested that consideration be given to maximising the use of water from Hinze Dam during the release period providing this is in accord with the interim operating strategy.

[redacted]
Acting General Manager
Regional Planning and Policy
Queensland Water Commission
L16 53 Albert Street
Brisbane QLD 4000
Phone: [redacted]
Mobile: [redacted]
www.qwc.qld.gov.au

From: Mary Boydell [redacted]
Sent: Friday, 10 December 2010 1:53 PM
To: [redacted]
Subject: Fwd: Recommended draw down of Hinze Dam

Begin forwarded message:

From: [redacted]
Date: 10 December 2010 1:38:03 PM AEST
To: [redacted]
Subject: FW: Recommended draw down of Hinze Dam

Mary
As discussed
Ps Barry is away at present on A/L.
Kind regards
[redacted]
Tel.
Mob

From: Dan Spiller [mailto[redacted]
Sent: Friday, 10 December 2010 1:12 PM
To: [redacted]
Cc: Barry Dennien; [redacted]
Subject: Recommended draw down of Hinze Dam

[redacted]

For information and advice, pending a more detailed brief for approval this afternoon.
Background
Seqwater has requested permission for the draw down. It proposes to release an additional 12,000 ML. Subject to our approval today, water would be released at the current rate until mid next week (about 65 cubic metres per second).

The drawdown has been requested to enable excavation of rockfill on the upstream side of the spillway. The lower storage level would allow conventional excavators to be used, which would complete the work in about three days.
Due to wet weather, project completion has now been delayed by one month to end January. The drawdown will assist in avoiding further delays.
Seqwater requires approval today, if it is to continue to release at 65 cubic metres per second. If it is not approved today, Seqwater will reduce releases over the weekend. At lower rates, the drawdown will not occur in sufficient time to complete the works before Christmas.
A similar request was considered last year, at which time the QWC had concerns about the public perception issues associated with releasing water at a time when the community was being actively encouraged to be water efficient. The context is now significantly different, with downstream flood immunity a significantly more important issue.
WGM assessment
The drawdown is needed for construction reasons.
Timely completion of the Hinze Dam upgrade is important, given rainfall forecasts for the remainder

of the current wet season. Project completion provides the opportunity to fill the dam to the new full supply level and, more importantly, improved flood security for downstream areas.
WGM modelling has confirmed that the drawdown would have no impact on regional water security. Modelling indicates that there would be no change to the likelihood of storages falling to 60 or 40 per cent of capacity within either three or five years. The probability of storages falling to these levels remains significantly less than the targets specified in the System Operating Plan.
With this security, it is recommended that the release and works be undertaken as soon as possible. This would minimise the delays to project completion and maximise the probability of the dam filling to the new full supply level within the current wet season. Releases at 65 cubic metres per second is consistent with this approach.
Roles and responsibilities
The water security impacts are an operational matter for the WGM. In considering these impacts, we must comply with the System Operating Plan.
Seqwater as dam operator has the ability to release the additional water.
Consultation
Ministerial advisers have no objections to the proposed drawdown. The advisers consider this to be an operational decision for the WGM. Should the WGM endorse the drawdown, they have request a brief for information only. However, they have noted that they are concerned regarding any potential delays to project completion.
Seqwater officers are assisting in drafting briefing material and are briefing the Ministers advisers directly on the project delays.
I seek your guidance on consultation with the QWC. Beyond the risk criteria, the SOP and Operating Strategy do not contemplate this request.
Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.
Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

****
The information in this email together with any attachments is intended only for the person or entity to which it is addressed and may contain confidential and/or privileged material.

Any form of review, disclosure, modification, distribution and/or publication of this email message is prohibited, unless as a necessary part of Departmental business.

If you have received this message in error, you are asked to inform the sender as quickly as possible and delete this message and any copies of this message from your computer and/or your computer system network.
****

Page 235 redacted for the following reason:
- -

Preliminary results show that the risk criteria are not affected by this change in supply level and the probability of Hinze Dam refilling over the short term is reasonably high.

Regional risk statistics

Table 1: System Operating Plan Rules

Trigger	1 year	3 years	5 years
T1	<0.2%	Not specified	<5%
T2	Not specified	<0.5%	<1%

Table 2: Case 1

Trigger	1 year	3 years	5 years
T1	0	0	<0.01%
T2	0	0	0

Table 3: Case 2

Trigger	1 year	3 years	5 years
T1	0	0	<0.01%
T2	0	0	0

Gold Coast System statistics

Table 4: Probability of Gold Coast system reaching 40%

	1 year	3 years	5 years
Case 1	0 %	3.4%	13.5%
Case 2	0%	3.7%	14%

Figure 1: Storage volume forecast Gold Coast System, Case 1

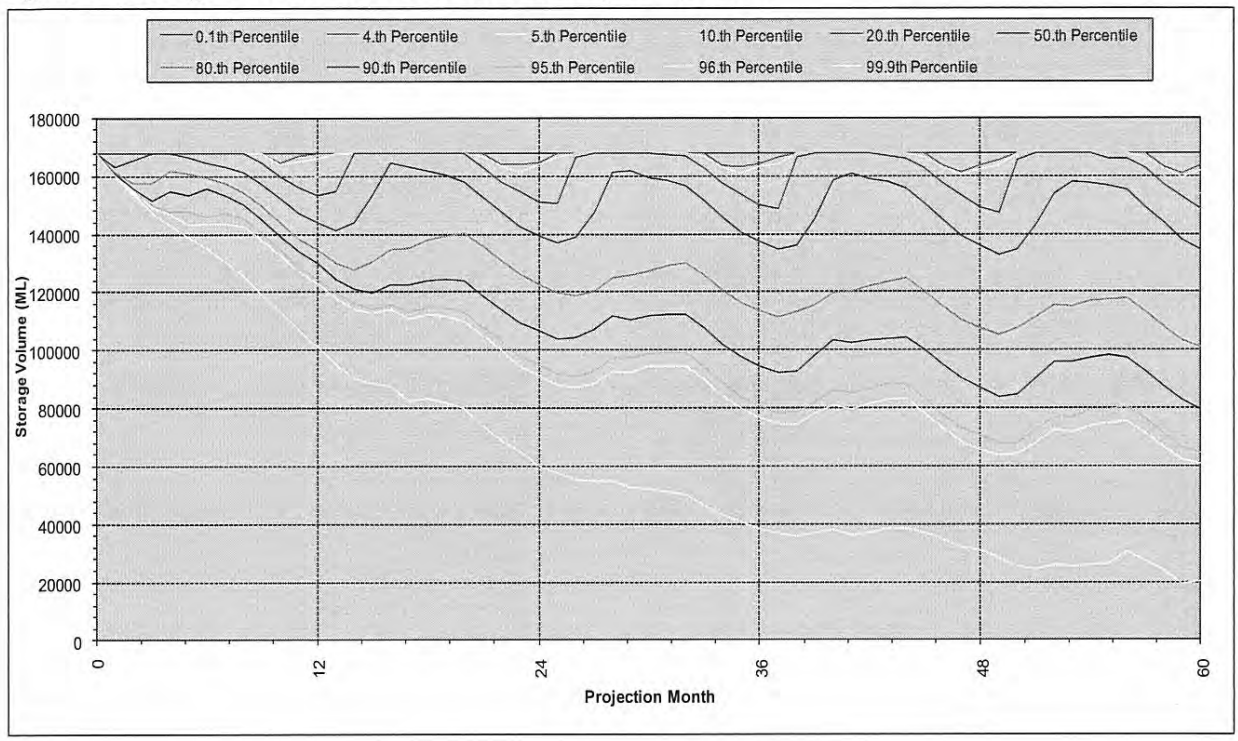
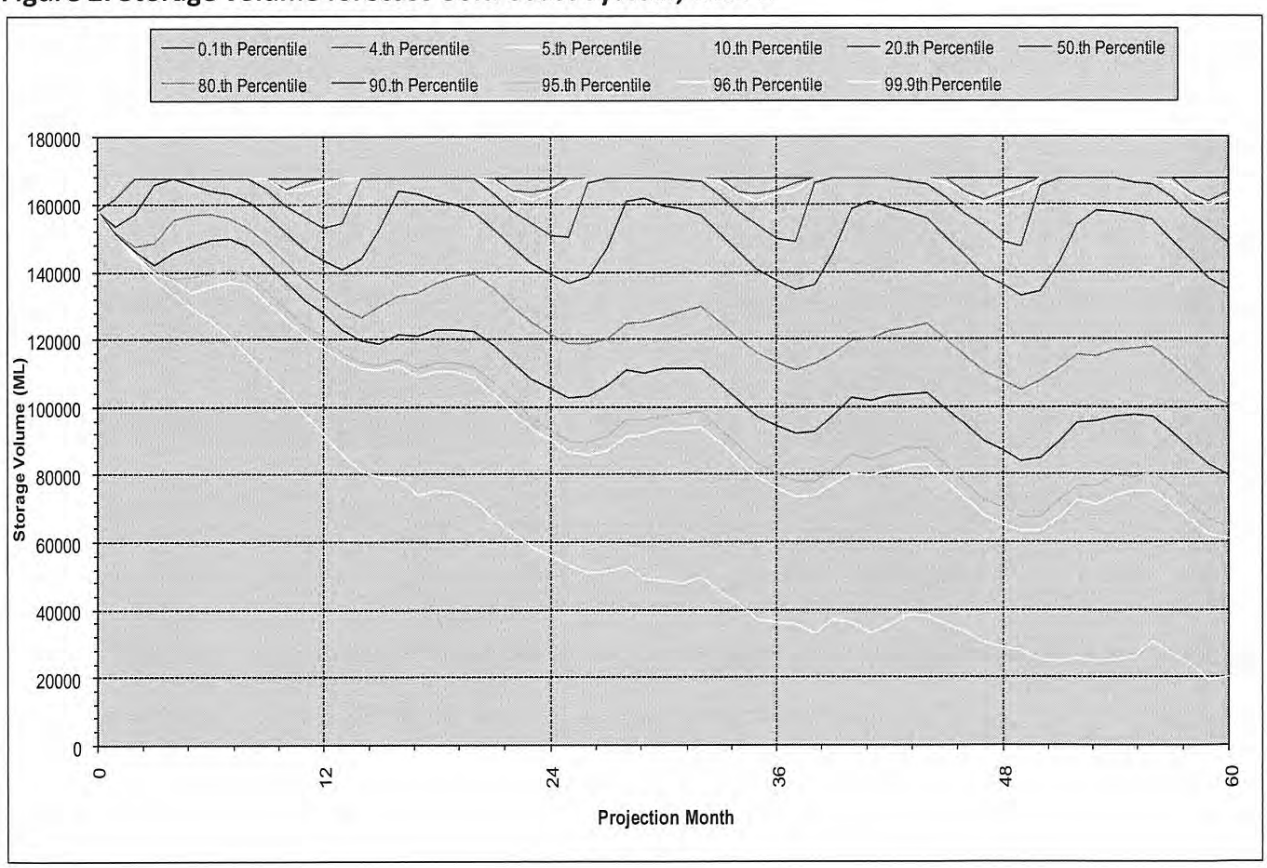


Figure 2: Storage volume forecast Gold Coast System, Case 2



Figures 1 and 2 show under the current case, 50% of simulated inflow scenarios return Hinze Dam to 100% within three months. With the release to 81m AHD 50% of simulated inflows returns the dam to 100% in approximately 4 months.

Real time inflow statistics

Seqwater provided estimates of current and ongoing inflow volumes based on no further rainfall being received in the catchment.

Seqwater advise that inflows to Hinze Dam are approximately 10 cumecs and these volumes are likely to halve roughly every 24 hours.

Estimates are that if 10 cumecs continues to be received as a base flow following the proposed release down to 81m AHD, the dam would be returned to a level requiring the gates to be operated again (under the Flood Operating Manual) in approximately 2 weeks.

The current BoM forecasts for this weekend are for widespread rainfall in the order of 50 mm with heavier isolated falls in some areas. It is quite likely that the Hinze Dam catchment will receive further rain this weekend resulting in continued inflows to the Dam.

Conclusion

1) Results show that this drawdown will have minimal impact on the long term regional risk criteria, as shown in Tables 1 to 3.
2) Table 4 shows minimal change to the probability of the Gold Coast system reaching 40% over the medium-long term.
3) The release of the dam results in a slight increase in the time taken to reach FSL for a given probability level.
4) Short term projections of rainfall over the coming weekend will likely result in continuing inflows over the coming week potentially during the proposed time of excavation.
5) The longer this work is delayed, the lower the likelihood of receiving inflows volumes required to refill the dam over the current summer season.

On balance it appears reasonable to provide our support to the release of this water to expedite the completion of the construction of the raised Hinze Dam.

Contact Officer:		Authorised:	
[redacted]		Daniel Spiller	
Water Engineer	_____	Director, Operations	_____
10 December 2010		10 December 2010	

[redacted]

From: Dan Spiller
Sent: Friday, 10 December 2010 4:26 PM
To: [redacted]
Cc: Mike Foster; Barry Dennien
Subject: Hinze Dam drawdown
Attachments: QA's Hinze Dam.docx

Categories: T3

[redacted]

For information, Hinze Dam will be draw down 92.5% of capacity over coming days.

The drawdown is being done to enable the completion of the critical construction task of excavating the rockfill in the channel upstream of the spillway. Removal of rockfill must be completed before the reservoir can be approved to commence storing water above the existing Full Supply Level.

Without the drawdown, completion of construction would be delayed. The extent of delay would depend upon rainfall. The dam has not been at 92.5% of capacity since mid 2010.

An additional 12,000 ML will be released, in addition to releases required to draw the dam down to the existing full supply level (to date, about 36,000 ML has been released during the current event). Water will continue to be released at about the current rate, with releases continuing for several days more than would otherwise be required. The exact release rates and duration will depend upon whether there is any further rainfall in the catchment area.

Background

Timely completion of the Hinze Dam upgrade is important, given rainfall forecasts for the remainder of the current wet season. Project completion provides the opportunity to fill the dam to the new full supply level and, more importantly, improved flood security for downstream areas.

WGM modelling indicates that the drawdown would have no impact on regional water security. This modelling indicates no change to the likelihood of key Water Grid storages falling to 30 or 40 per cent of capacity within either three or five years following the release proposed. The probability of storages falling to these levels remains significantly less than the targets specified in the System Operating Plan.

With this security, there are benefits to undertaking the release and works as soon as possible. This would minimise the delays to project completion and maximise the probability of the dam filling to the new full supply level within the current wet season.

Seqwater and the Alliance will manage the release, in accordance with statutory and regulatory requirements. The WGM has advised that it has no objections from a water security perspective. The QWC agrees with this advice.

We are not proposing any public statements, but we have prepared some basic questions and answers for internal information only.

Please call me if you require any further information.

Regards,
Dan

Daniel Spiller

Director, Operations
SEQ Water Grid Manager
[redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

Q&A's Hinze Dam

What is being done?

Hinze Dam Stage 3 will see the dam wall raised by 15 metres. Raising the Hinze Dam wall will provide improved flood mitigation for the downstream Nerang River valley, almost double the storage capacity of the dam and provide an increased yield into the SEQ Water Grid.

Why is water flowing down the Nerang River?

The Hinze Dam spillway was originally a passive spillway, in that whenever the water exceeded the full supply level, it would flow over the spillway and down the Nerang River.

The Stage 3 Upgrade has seen the installation of emergency release gates and water is currently flowing through those gates as the dam has exceeded its Stage 2 FSL and is not yet able to store additional water to the new Stage 3 FSL.

This flow down the Nerang River is no different to other spillway overtopping event prior to or during the Stage 3 Upgrade Project.

Why does the water need to be lowered below the Stage 2 FSL?

As part of construction, the Hinze Dam Alliance placed crushed rock on the upstream side of the spillway to provide an interim roadway and also a working pad for a 230 tonne crane which was sued during the spillway construction work and the installation of the emergency gates.

This rockfill is no longer required and needs to be removed. To do this, the storage level of the dam needs to be reduced by approximately 7.4%. This means releasing approximately 12 000 megalitres through the gates. Once the water has been released and the lower storage level reached, the gate will be shut and the rockfill excavated from the site in around 3 days.

Once the rockfill has been removed, the water level will be allowed to return to Stage 2 FSL levels.

Why is it being done now?

To ensure regulatory completion of Hinze Dam Stage 3 by December 2010, the rockfill needs to be removed now.

Will there be impacts downstream?

There should be no impacts any properties downstream of Hinze Dam. There has been a flow from the gates (due to rainfall and levels above the Stage 2 FSL) for several days and this had not created any downstream impacts.

Will drinking water supplies be impacted?

There will be no impact on drinking water supplies. Hinze Dam will still provide 200 megalitres to the Water Grid – 170 megalitres for the Gold Coast and 30 megalitres for Logan.

What does this mean for flood mitigation?

Mitigation against potential flooding in the Nerang River catchment is the key driver behind the decision to raise the Hinze Dam wall.

CTS No. 21654/10

I/10/0523

Advisor	OK
Dated	/ /
Approved	**Not Approved** **Noted**
Further information required	
Minister.....	
Dated	/ /

SEQ Water Grid
MINISTERIAL DEPUTATION BRIEFING NOTE
SEQ Water Grid Manager Board Meeting
Monday 13 December 2010 at 1.00pm

TO: **Minister for Natural Resources, Mines and Energy and Minister for Trade**

SUBJECT: Points for discussion for meeting with the SEQ Water Grid Manager Board

BACKGROUND

- The Minister has been invited to meet with the South East Queensland (SEQ) Water Grid Manager (WGM) Board on 13 December 2010 at 1.00pm.
- The WGM intends this to be an informal meeting which will include a tour of the newly completed Water Grid Emergency Management Room and provide an opportunity for the Minister to ask questions and discuss the operation of the Water Grid.
- All WGM Board members will attend the meeting. All members of the WGM executive management team will also attend this meeting.

CURRENT ISSUES

- In addition to providing a tour of the newly completed Water Grid Emergency Management Room, the WGM is particularly interested in discussing three matters with the Minister, namely:
  1. General feedback from the Minister on the WGMs optimal operation of the Water Grid, focused on the WGMs Climate Resilience Report,
  2. An update of the role of the SEQ Water Grid Manager in the planning and approval process for capital expenditure, and;
  3. An update on Wivenhoe Dam's operating level, for flood mitigation.
- The Minister wrote to the WGM and WaterSecure on 13 September 2010 (CTS13479/10), requesting advice on optimised operating arrangements for the Water Grid and climate resilient supply projects, in relation to current and potential demand for bulk water and purified recycled water.
- The Minister also wrote to QWC in September 2010 (CTS13479/10), inviting QWC to provide input into optimal operating arrangements for the Water Grid.

Climate Resilience Report

- The WGMs Climate Resilience Report (the Report) has been completed and sent to responsible Ministers.
- The Minister replied to this advice on 3 December 2010 (CTS21372/10).
  Further to the Ministers response of 3 December 2010, the Minister will be advised on the timing and program for implementation of the recommended strategy, during the meeting with the WGM Board and executive management team on 13 December 2010.

Emergency Response

- The WGM would also like to provide the Minister with a general demonstration of the Emergency Management Room facilities. This will mainly involve a demonstration of the

Author	Cleared by	Cleared by	Recommended:
Name: [redacted]	Name: [redacted]	Name:	Name:
Position: Snr Correspondence Officer	Position: Director	Position:	Tel No:
Tel No: [redacted]	Tel No: [redacted]	Tel No:	Date:
Date: 3 December 2010	Date: 3 December 2010	Date:	
	Name : Barry Dennien	Name:	
	Position: CEO, SEQWGM	Position:	
	Tel No [redacted]	Tel No:	
	Date: 3 December 2010	Date:	

File Ref:

new OCA Incident Manager which is being implemented as a result of the recommendations from the Exercise Matrix.

- The Exercise Matrix, the test of the Water Grid's response to an emergency, was successfully completed over the period 2 to 3 March 2010. The exercise was facilitated and conducted by MC2 Pacific, an independent emergency management consultancy, who assessed the suitability and effectiveness of responses by Grid Participants. As a result of the Exercise Matrix MC2 Pacific prepared a report containing recommendations for the WGM.
- The WGM has accepted and will implement all recommendations developed by MC2 Pacific. The State Disaster Coordination Centre in Emergency Management Queensland supported the recommendations included in the MC2 Pacific report.
- The MC2 Pacific recommendations (CTS10434/10) noted that there were several major strengths, like technical strategy, and weaknesses, both in the processes and their deployment and handling of communications, in the multi-participant test. Specific actions were recommended in relation to documentation and implementation (CTS10434/10).
- The OCA Incident Manager system (the system) is a secure, online software solution for managing emergencies across the Water Grid. It gives the WGM and all Grid Participants involved the tools to manage an emergency in one place, in real time.
- The system provides a live, up-to-date solution for managing whole-of-Grid emergencies and aligns with the SEQ Water Grid Risk Management Plan. The system has the ability to send communications, manage incident information and monitor situation reporting, logging and mapping.
- The Minster and relevant staff from the Ministers Office will be set up as 'visitors' on the system, meaning that they are able to view key incident management data, including situation reports, in real time.

Planning and approval process for capital expenditure

- The Minister wrote to the Chair of the WGM on 20 October 2010 (CTS17750/10), in relation to clarification of the role of the WGM in the planning and approval process for capital expenditure.
- The WGM will provide response to the Ministers correspondence shortly.
- The WGM will also provide a verbal update of capital expenditure planning and approval process at the meeting of 13 December 2010.

Wivenhoe operating level, for flood mitigation.

- The Minister also wrote to the Chair of the WGM on 25 October 2010 (CTS19311/10), seeking advice regarding available options and likely benefits of releasing water from key storages in anticipation of major inflows over the coming summer.
- The WGM will provide response to the Ministers correspondence shortly.
- The WGM will also provide a verbal update of options and likely benefits of reducing Wivenhoe Dam's operating level, for flood mitigation in anticipation of major inflows from rainfall in the catchment area over summer, at the meeting of 13 December 2010.

MNISTER'S COMMENTS

ATTACHMENTS
There are no attachments to this Brief

Author	Cleared by	Cleared by	Recommended:
Name: [redacted] Position: Snr Correspondence Officer Tel No [redacted] Date: 3 December 2010	Name [redacted] Position: Director, SEQWGM Tel No: [redacted] Date: 3 December 2010	Name: Position: Tel No: Date:	Name: Tel No: Date:
	Name : Barry Dennien Position: CEO, SEQWG[redacted] Tel No: [redacted]6 Date: 3 December 2010	Name: Position: Tel No: Date:	

File Ref:

SEQ Water Grid manager

Board meeting

Meeting number	11–12/10
Date	13 December 2010
Agenda item	12

Minister Robertson in attendance

Background

Below sets out the agenda for the meeting scheduled from 1.00 - 2:00 pm:

- A general demonstration of our Emergency Management Room facilities by Scott Denner. This will involve a demonstration of the new OCA Incident Manager.
- A discussion around the following matters:
  - feedback from the Minister on the optimal operation of the SEQ Water Grid, focusing on the Climate Resilience Supplies Report
  - an update of the role of the SEQ Water Grid Manager in the planning and approval process for capital expenditure
  - an update on Wivenhoe Dam's operating level for flood mitigation.

The Department of Environment and Resource Management has been advised of the above and have briefed the Minister's office accordingly. The Minister's office has been provided with the:

- Operating Strategy
- Climate Resilience Supplies Report.

We are in the process of developing advice on dam operating levels for flood mitigation and the planning and approval process for capital expenditure.

Document approval

Date	Name	Signature
03.12.10	[redacted] Director, Governance and Regulatory Compliance	[redacted]

From: Barry Dennien [redacted]
Sent: Friday, 17 December 2010 10:56 AM
To: Rob Drury
Cc: Dan Spiller; Peter Borrows; [redacted]
Subject: URGENT

Rob

I note the gates are opening once again tonight and that the dams (Wivenhoe / Somerset combined) only got to 102% approx during the first release.

For process clarity:

1. Was the plan for the original release to keep the dam above FSL
2. When and by who was the decision to reopen the gates tonight
3. Was a technical situational report reissued if so when we do not appear to have a copy however the communications unit do have a notification from Mike Foster.
4. What is the basis of the next release
    a. What release time and combined Dam level targets are being set.

The reason for the questions is to Brief the minister and DG ASAP and to be prepared for the media questions.

Barry

From: SEQWGM Media
Sent: Friday, 17 December 2010 10:22 AM
Subject: Media update: dam releases

Media update – Dam releases – 17 December 2010 (Morning)

Following storm activity and rainfall in the Wivenhoe catchment area yesterday, a single spillway gate at Wivenhoe Dam will be opened at 6.00 pm tonight.

Based on the current forecast, the gate is expected remain open into next week. While releases will begin at approximately 8,000 megalitres per day, this amount may be increased over the weekend.

Releases from Somerset Dam into Wivenhoe Dam have been reduced to around 6,000 megalitres per day, however this amount may also be adjusted over the weekend if greater inflows are received.

A release was made overnight from North Pine Dam, in consultation with the Moreton Shire Regional Council. The spillway gates were closed before 7.00 am this morning.

Overnight releases are designed to have minimal impact on the surrounding community.

The Water Grid will continue to work with local councils regarding the release water from Wivenhoe Dam. All releases are being managed in accordance with approved flood management plans.

For further information on the Water Grid: www.watergrid.com.au

ENDS

Note to the Editor: While Wivenhoe is spilling routine updates will be provided mid morning and mid to late afternoon.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information visit www.seqwgm.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) [redacted] | Email: media@seqwgm.com.au

From: Rob Drur[redacted]
Sent: Sunday, 19 December 2010 11:39 AM
To: Barry Dennien;[redacted]
Cc: Mike Foster;[redacted] Peter Borrows;[redacted] Dan Spiller
Subject: RE: FOC Situation Report #3 0630 19/12/2010

Barry,
As for Wivenhoe, we are currently releasing at the maximum we can without impacting on Burtons already. With the rain currently falling we may have to throttle back to keep Burtons out. And consider options this week if we get the predicted rain.

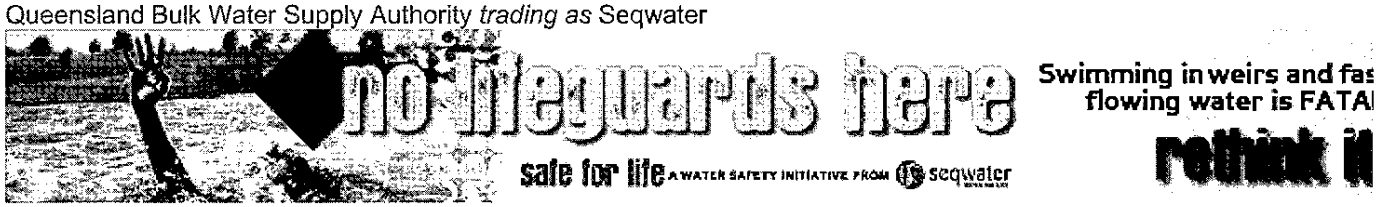
As for North Pine, releasing down to say 95% may require an all day release or longer and we have been doing night time releases where possible which Council seems okay with as it has less impact. Trying for a night time release of higher volume to get to 95% may require much higher flow rates, possibly 2 or 3 times what we have been doing. This could have implications downstream apart from just closing Youngs Crossing.

I have raised the North Pine possibility with the Dam Regulator Peter Allen and will talk to him again tomorrow but he had some concerns about such extended releases or higher rate releases without going through all the possible implications.

I might see if we can arrange a discussion with him tomorrow or early this week to go through possible scenarios and issues.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Barry Dennien[redacted]
Sent: Sunday, 19 December 2010 9:34 AM
To:[redacted] Rob Drury

Cc: Mike Foster; [redacted] Peter Borrows; [redacted] Dan Spiller
Subject: Re: FOC Situation Report #3 0630 19/12/2010

Rob

Can we consider a longer faster release rate for both north pine and wivenhoe working between the parameters of plus and minus 5% of fsl

The release rate should consider maximum rates below closure of key crossings eg colleges and burtons bridge

In the case of north pine dam a max flow across youngs crossing without impacting the next crossing or flood impact area

I sense this on and off again release will continue for at least a week and the public will soon start to get critical

Can we also consider a release strategy during a low impact time eg weekends Xmas break

I understand the current plan rules however I sense some flexibility in the plan and the wgm is willing to consider releasing some of it's water allocation

Regards
Barry Dennien

On 19/12/2010, at 9:14 AM, [redacted] wrote:

> Thanks [redacted]
> I think we can maintain our intended position of not putting out an update until tomorrow AM.
> Regards[redacted]
>
> Sent from my iPhone
>
> On 19/12/2010, at 9:16 AM, "Mike Foster" <[redacted]> wrote:
>
> [redacted]
> See update below
>
> Hotline will be updated to reflect the below
>
> Chrs mike
>
> ---
>
> **From:** Rob Drury
> **To:** Mike Foster
> **Cc:** Jim Pruss
> **Sent:** Sun Dec 19 07:10:09 2010
> **Subject:** FW: FOC Situation Report #3 0630 19/12/2010
>
> Mike,
>
> See below for details but main points are

NPD operated last night but closed and good chance again in next few days

W/S

Continuing current strategy of release from Somerset into Wivenhoe and Wivenhoe downstream. Would not use too many actual volumes as could change.

And the three bridges closed for several days to come. But further rain may change release strategy.

Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.jpg>

<image002.png>

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

From: Duty Enginee[redacted]
Sent: Sunday, 19 December 2010 6:38 AM
To: [redacted] Mike Foster; Rob Drury; [redacted]; Bill Stephens; [redacted]

[redacted]; John.Ruffini[redacted]; John Tibaldi; Rob.ayre[redacted] Terry Malone;[redacted] Graham Keegan; [redacted]

Subject: FOC Situation Report #3 0630 19/12/2010

North Pine Dam

No significant rain was recorded in the 24 hours to 0700 Sunday 19/12/2010 and upstream gauges are continuing to fall slowly. At 0600, the North Pine Dam level was at 39.50 m AHD and all gates will be closed by 0700. Approximately 4,500 ML was drained from the dam overnight. A fish recovery team is in place.

MBRC were advised at 0615 that all gates will be closed by 0700 Sunday.

However, further rainfall is expected overnight Sunday into Monday and a catchment average in excess of just 30mm may require renewed gate openings during Monday.

Somerset/Wivenhoe Dams

In the Upper Brisbane River, storms on Saturday afternoon dumped 20 to 30mm in the Monsildale area but elsewhere in the Upper Brisbane and Stanley Rivers falls were much lower.

At 0600 Sunday, Somerset Dam was 99.56 m AHD (ALERT gauge) and falling slowly. Two regulators remain open at Somerset Dam, giving a release of around 12,000 ML/day into Wivenhoe. These releases are expected to continue for several days, especially as further rain is forecast in the next 24 hours.

The storms on Saturday afternoon caused renewed river rises in the Upper Brisbane and at 0700 Sunday 19/12/2010, the Brisbane River at Gregors Ck was nearing a peak. Significant Inflows to Wivenhoe will continue for several days.

Wivenhoe Dam was 67.30 m AHD at 0600 Sunday and falling very slowly. Water levels are expected to remain around this level for the next 24 hours. There is currently has one gate open at 3.5 metres providing a release of about 350 m3/s. This release is

expected to continue until at least Wednesday and perhaps longer depending forecast rain in the next 36 hours.

Twin Bridges, Savages Crossing and Colleges Crossing are closed. Savages Crossing and Colleges Crossing are expected to remain closed until at least Wednesday with Twin Bridges closed for a much longer period.

The current strategy is to drain Somerset and Wivenhoe back to full supply level by mid week and has Kholo and Burtons Bridge remaining open, but this may change depending on the rainfall experienced in the catchments in the next 24 hours

Forecast for Brisbane area:

Sunday Increasing rain periods, some moderate to heavy falls possible, especially late afternoon and overnight.

Monday	Becoming dry, windy
Tuesday	Fine
Wednesday	Mostly fine, possible shower
Thursday	A shower or two
Friday	Showers
Saturday	Showers

Terry Malone

Duty Engineer

Flood Operations Centre

Phone: [redacted]

Fax:

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Dan Spiller
Sent: Monday, 20 December 2010 7:28 AM
To: Barry Dennien; [redacted]
Subject: Releases

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: T3

Barry an[redacted]

Ron Drury rang. Due to rainfall over the weekend they will need to increase releases, taking out the next two bridges. They are considering up to 1200, depending upon other flows. Will advise later this morning.

They are consulting with Councils, with Lockyer and Ipswich anxious to avoid outages over Christmas.

Consistent with Barry's email, I asked them to consider options to bring level below 100%. At the ;gher rate, it may just be an additional day of releases.

Speak soon.

Dan

From: Mike Foster [redacted]
Sent: Thursday, December 23, 2010 9:56 AM
To: Dan Spiller [redacted]
Cc: Barry Dennien [redacted]; Peter Borrows [redacted]; Jim Pruss [redacted]; Barton Maher [redacted]
Subject: Hinze Dam draw down

Hi Dan,

Just a quick note to advise approval to lower of the storage levels of Hinze Dam below FSL to allow the excavation of rockfill placed for construction haul roads in the spillway approach channel has been successful.

Thanks to the lowering of the storage all of the rockfill was removed to a lower level than originally planned minimising any future risks. Your assistance and that of the Water Grid Manager is greatly appreciated.

Importantly with the recent rainfall and inflows the dam levels have now returned to FSL of EL 82.2. There is no requirement for the project to draw the dam down again.

On a related issue, the Hinze Alliance has today been contacted by the Gold Coast Mayor's office querying the drop in levels over the past week or so.

The Alliance will be advising releases were required to finalise dam construction noting that the dam levels have now returned to the current FSL.

Cheers Mike

Mike Foster
Manager Strategic Relations & Communication
Queensland Bulk Water Supply Authority *trading* as Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000.
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Barry Dennien
Sent: Monday, 20 December 2010 11:55 AM
To: Dan Spiller
Subject: Letter to Minister - flood management
Attachments: Letter to Minister - flood management.docx

Follow Up Flag: Follow up
Flag Status: Flagged

Rough as

TRIM ref: D/10/79S3

17 December 2010

Hon Stephen Robertson MP
Minister for Natural Resources, Mines
and Energy, and Minister for Trade
PO Box 15216
Brisbane QLD 4001

Dear Minister

I am pleased to respond to your letter of XXX 2010 regarding the management of potential flood impacts for the SEQ Water Grid. The following response has been provided based on discussions with Seqwater.

Of all the dams in the South East Queensland region only four are gated and have the ability to release water rapidly as a flood response. The other dams have small release valves that are sized for urban, agricultural and environmental uses on a regular basis and spillways that serve the purpose of relieving surplus flood water on an infrequent basis.The Wivenhoe Somerset Dams, North Pine Dam and Leslie Harrison Dam are gated dams and have been considered separately below.

Wivenhoe Somerset Dam factors

Several factors influence that flood release strategies in SEQ. Rain events that have caused flooding have historically been prolonged events over several days and have a return period several days to a week after the first rain event. This has driven the Wivenhoe Somerset strategy to ensure all water held in the flood compartment to be releases seven days after the rain event in readiness for the next event.

Secondly, approximately 50% of the catchment in upstream of the Wivenhoe Dam wall whilst 50% is below the dam wall and no flood mitigation structures exist for most of the potential runoff. The Bureau of Metrology has had limited success in plotting rainfall distribution accurately to assess where most flooding risk lies above or below the Dam wall. Historical floods have demonstrated that flooding can occur from both; the 1974 flood flows

primarily occurred below the dam wall whilst the 189# event occurred above the Dam wall. The outcome of this factor is when releasing water from Wivenhoe it is very important to predict and monitor below the dam wall flows as to understand combined river flows that cause flood impacts.

Predicting rainfall intensity and location even as events are about to occur has not been accurate however the BOM are improving its methods. To have a pre-emptive lowering of water storage to increase flood compartments in dams the more accurate the forecast inflows the better chance of selecting the correct levels.

The flood storage compartment of Wivenhoe is 1,450,000 megalitres the combined water storage volume of Wivenhoe and Somerset is 1,450,000 megalitres. During an large rain event when the catchment is wet inflows to the dam can reach #### cubic meters per second or #### megalitres per day. The flood storage can fill in days. The basic strategy is to match release rates with inflow rates.

Finally, the flood release strategy for Wivenhoe Somerset has a hierarchy of objectives:

1. Ensure the structural safety of the dam
2. Provide optimum protection of urbanised areas from inundation
3. Minimise disruption to rural life
4. Retain full supply level after a flood event
5. Minimise impacts to flora and fauna during the drain down phase

Wivenhoe Somerset Assessment

Flood releases from Wivenhoe Dam typically fall into two categories of flood events based on the impact they cause when combined with below the dam wall catchment runoff. Smaller events with combined river flows of less than 1900 cubic meters per second measured at the Mt Crosby weir impact seven rural bridges causing a range of minor disruptions to a few families to the extreme case . Larger events typically require combined river flows greater than 3500 cubic meters per second measured at Moggil and have flood impacts on urban areas in Brisbane..There is a transition period between these events when management of the releases is focused on keeping river flows below 3500 cubic meters per second The possible benefits of lowering dam storage levels to reduce flooding impacts is addressed below in relation to these two event types.

Modelling investigations undertaken by Seqwater (refer Attachment 1) have identified that lowering the full supply level of Wivenhoe Dam by 33% may result in a reduction of impact for small events in the order of 15 per cent by reducing the total bridge inundation times for low level bridges. We believe that this outcome is worth pursuing with Seqwater immediately and that currently there is adequate flexibility to refine the release strategy in the existing Manual of Flood Mitigation for Wivenhoe and North Pine Dams.

In relation to releases during larger events (river flows above 3500 cubic metres per second at Moggil), modelling work undertaken by Seqwater has identified that reducing the starting volume of Wivenhoe Dam will have little downstream impacts on river levels. Peak river levels are the controlling factor not duration of the event due to the fact once a property is inundated time has a lesser effect.

However it has been identified that it is worth investigating the impacts on downstream flooding for intermediate level flows (flows between 1900 and 3500 cm^3/s)

Seqwater will undertake extensive investigations for the Queensland Water Commission in early 2011 to examine the opportunity of raising the full supply level of Wivenhoe Dam for water supply. We will recommended that the scope of this work be widened to consider the benefits of pre-lowering storage levels based on mid range rainfall events and the reduced impacts to river levels and subsequent property impacts.

If you have any questions, please do not hesitate to contact Mr Dan Spiller, Director Operations, by telephone on [redacted] or by email on [redacted]

Yours sincerely

Barry Dennien

Chief Executive Officer

Attachment 1:

Discussion Paper on Dam Full Supply Level Investigations Seqwater Gated Storages

Attachment 1

Summary of comments

The attached paper summarises an analysis that changing the initial storage level of dams has on downstream flood impacts.

Wivenhoe/Somerset System

The analysis shows that for some minor floods similar to October 2010, reducing the starting volume of Wivenhoe Dam by 5% or 10% has minimal impacts on impacts downstream. The main benefit being that inundation times for downstream bridges will be reduced but only by around15%. However peak water levels are not affected. There are minimal potential benefits to downstream bridge until dam levels are reduced down to about 50% of capacity.

These results are not unexpected as Wivenhoe has such a large flood storage. Adding say 100,000ML to the flood storage (equates to reducing the storage volume by 10%) does not appreciably increase this available flood storage.

It should also be noted that in many cases, Wivenhoe flood releases will be made following the peaks of inflows into the Brisbane River from the Lockyer and Bremer Catchments. Certainly during many events, Lockyer Creek could already have inundated most or all of the road crossings downstream of Wivenhoe Dam. In these instances, a small amount of additional flood storage in the dam provides minimal benefit.

Another option considered was pre-releasing Wivenhoe water in anticipation of a flood event. This is not considered a viable option for the following reasons:

- Regardless of forecast, there is never any certainty on the amount of rain that will fall within a dam catchment. For example, on 29 November 2010, the quantitative forecast from BOM for the Wivenhoe Catchment was 25 to 50 millimetres. Actual rainfall received was in the order of 10 millimetres. On a saturated catchment this could equate to a runoff discrepancy of hundreds of thousands of megalitres. A pre-release of anticipated flood water based on forecast could result in major embarrassment.
- Any significant pre-release of water would result in bridge inundation below Wivenhoe Dam.
- Any pre-release of water from Wivenhoe Dam will take at least 24 hours to reach the lower end of the Brisbane River system. Rains occurring in the catchments below the dam over this period could potentially worsen downstream flood impacts.

The Bureau of Meteorology has been contacted and they have confirmed the above forecast reliability assessment. They advised that, whilst weather prediction models are steadily improving, the forecast of rainfall amounts over catchment time/space scales is recognised as one of the most challenging/difficult tasks. Detailed rainfall forecasting is not deterministic - the uncertainties involved are often expressed in probablistic forecasts and whilst there is often the ability to forecast the potential for a significant rain event to occur in the southeast Qld-northern NSW region, it is difficult (if not impossible) to predict the actual location of the heaviest rain, even with only a few hours notice.

The Queensland Director of Dam Safety (Mr Peter Allen) was contacted and he confirmed the assessment that minor reductions in the stored volume of Wivenhoe Dam would have minimal impacts on floods downstream and concurred with the risks involved in any pre release of significant volumes of water from dams prior to an event.

North Pine and Leslie Harrison Dams

Lowering the normal FSL for North Pine and Leslie Harrison Dams will have minimal impact on major floods and may not decrease releases depending on the size of even minor events. However lowering the level of North Pine Dam after a flood release to between 95% and 100% may reduce the frequency of operations in some rain events although the main benefit is in operational efficiency as it provides more time for response and may reduce making releases in a minor storm event.

Similarly reducing Leslie Harrison level to around 95% after or before an event could assist in reducing call out of staff and manning the storage for minor releases and even the timing of releases.

Normally both dams are returned to just under 100% after an event based on base inflows still occurring and possible further rain. Allowing the dams to reduce to around 95% improves the operational leeway. However this could best be provided by an operational arrangement where the WGM simply agrees Seqwater has the operational latitude to reduce both storages to between 95% and 100% after an event or when there is some inflow and Seqwater can decide the exact level based on ongoing inflows and possible predicted rainfall, but not going below 95%.

DAM FULL SUPPLY LEVEL (FSL) INVESTIGATIONS
SEQWATER GATED STORAGES

INTRODUCTION

The following short paper examines the issues associated with temporary lowering the full supply levels of Seqwater's gated dams to improve short term flood mitigation benefits. The paper considers Wivenhoe Dam, Somerset Dam, North Pine Dam and Leslie Harrison Dam.

WIVENHOE DAM AND SOMERSET DAM

Wivenhoe Dam and Somerset dam control only 50% of the Brisbane River catchment (Bremer River and Lockyer Creek catchments are not controlled), therefore the Flood Mitigation benefits provided by the dam will depend on the rainfall distribution experienced during a flood event. This makes it difficult to quantify exactly the benefits of lowering the storage in anticipation of possible flood rains.

There are primarily two types of flood events that may occur in the Brisbane River Catchment. There are the smaller events that impact primarily on the rural bridges upstream of Moggill and the larger events that impact on urban areas in Brisbane. The threshold that separates these two events is a river flow of around 3500 cubic metres per second at Moggill. To understand the possible benefits of lowering the storage to reduce flooding impacts, it makes sense to discuss these two types of events separately.

Events Impacting on Bridges (Moggill Flow < 3500m^3/s) – Limited Urban Impacts

In recent history, flood events of this nature occurred in April 1989, February 1999 and October 2010. The flow characteristics of events of this type are shown in the following table.

Event	Wivenhoe Dam					
	Starting Level		Volume Of Inflow	Volume Of Outflow	Peak Outflow	Peak Water Level
	m AHD	%	ML	ML	m3/s	m AHD
Early April 1989	67.06	>100	690,000	690,000	1,620	69.78
Late April 1989	67.00	100	870,000	820,000	1,490	71.45
February 1999	63.92	<100	1,220,000	900,600	1,800	70.45
October 2010	67.03	>100	640,000	640,000	1,300	69.65

The October 2010 event was examined to determine the benefits of lowering the storage level. This event commenced with the dam at FSL. The event was examined with the dam at 95% capacity, 90% capacity, 80% capacity, 50% capacity and empty at the commencement of the event. The results are shown in the following table. When reading the table it is important to understand that the bridges are impacted not just by outflows from Wivenhoe, but also by flows from the uncontrolled areas of the river catchment. Accordingly, the location of a bridge within the system will dictate the size of catchment area that will impact on the bridge. All inundation times shown in the table are approximations only, made for the purposes of this investigation.

Dam Percentage Full at Event Commencement	Approximate Duration of Wivenhoe Radial Gate Releases/ Twin Bridges Inundation (hours)	Approximate Duration of Savages Crossing and Colleges Crossing Inundation (hours)	Approximate Duration of Burtons Bridge and Kholo Bridge Inundation (hours)	Peak Flow at Moggill (m^3/s)
100%	230	247	183	1848
95%	187	214	183	1848
90%	185	214	183	1841
80%	172	214	183	1786
50%	130	214	153	1722
0%	0	189	38	940

The table shows that the reduction in FSL won't have a large impact on Bridge inundation times. A reduction in the order or 36 hours or 15% of the total inundation time may be possible for the low level bridges only. The reductions are generally caused by the delay in release commencement associated with the lower starting FSL. However, the bridges can often already inundated at this time anyway due to flood inflows into the Brisbane River from the 50% of the catchment not controlled by Wivenhoe Dam. Lowering the FSL of the dam has no impact on such inundations as shown in the table.

For events smaller than those considered above, it should be noted that the Manual of Flood Mitigation allows a trigger level buffer of 27500 megalitres above FSL and this has the effect of protecting Twin Bridges and the lower level bridges from inundation as a result of minor events. Twin Bridges is essentially a low level causeway that is inundated following any radial gate release. This inundation could possibly be prevented by raising the bridge deck level. Regardless, the areas accessed using this bridge can also be accessed using the Fernvale Bridge. It is acknowledged however that the closing of Twin Bridges causes inconvenience to local residents, as it adds approximately another five kilometres to the journeys to and from their residences. Approximately 40 residences and several businesses (primarily turf farms) are impacted.

Events Impacting on Urban Areas (Moggill Flow > 3500m^3/s) – All rural bridges inundated

Events of this nature have not been experienced since the construction of Wivenhoe Dam was completed in 1984, with the last event of this nature being experienced in 1974. The inflow volume into Wivenhoe Dam associated with the 1974 event has been estimated to be in the order of 1.5 million megalitres. However during the 1974 event, an additional 1.5 million megalitres of flood flow impacting of the urban areas of Brisbane originated from catchment areas that are not controlled by Wivenhoe Dam.

For events of this nature, it is unlikely that peak water levels in Brisbane would be significantly impacted by minor reductions in the level of Wivenhoe Dam. Certainly reductions in dam volume in the order of at least 250000 megalitres would be needed to provide any significant reduction in water level peaks experienced in urban areas. Additionally, reductions in the FSL of this order would not necessarily guarantee reductions in urban flood levels, as the effectiveness of Wivenhoe Dam in reducing urban flood levels is directly dependant on the distribution of rainfall in the Brisbane River catchment during a

flood event (Wivenhoe Dam controls only 50% of the total Brisbane River catchment) and the spacing between individual flood events.

NORTH PINE DAM

North Pine Dam has no flood mitigation potential. Unlike Wivenhoe Dam, once the dam has reached FSL, all water flows into the dam must be released to protect the structural safety of the dam.

Any radial gate operation at North Pine Dam to release flood water, results in inundation of Youngs Crossing Road, so lowering the FSL is problematic and may best be achieved by increasing the daily water diversion to the North Pine Dam Water Treatment Plant. There are river release valves that allow some water to be drained from North Pine Dam without inundating Youngs Crossing. These valves have been operated continuously since the recent gate releases to manage residual inflows into the dam. However outflows from these valves are restricted to flows in the order of several hundred megalitres per day as larger flows will adversely impact on Youngs Crossing. Certainly a small reduction in the level of North Pine Dam is potentially beneficial in preventing closures of Youngs Crossing Road associated with small storm events.

It should be noted however that Youngs Crossing Road is also impacted by uncontrolled flood flows from Lake Kurwongbah and local storm run-off. In recent times Youngs Crossing Road has been closed by flood water during times when no water releases were being made from North Pine Dam, but when storm rains resulted in flood flows from uncontrolled areas of the catchment.

The table below gives an indication of the rainfall required to operate for NPD:

Level	Capacity			Rainfall Required to Operate	
				Wet Conditions	Dry Conditions
	m AHD	%	ML	mm	mm
FSL	39.60	100.0%	214,302	5	60
Reduced FSL	39.10	95.0%	203,618	35	100

Recent changes to the Manual of Flood Mitigation for North Pine Dam allows for some ability to retain up to 2500 megalitres of water to reduce impacts on Youngs Crossing Road,

provided favourable weather forecasts are experienced. However the preferred option to reduce public inconvenience associated with storm events would be to raise the flood immunity of the river crossing on Youngs Crossing Road. This crossing is primarily a low level causeway that is potentially unsuitable given the volume of traffic that now uses this crossing on a daily basis.

LESLIE HARRISON DAM

Similar to North Pine Dam, Leslie Harrison Dam has no flood mitigation potential. Once the dam has reached FSL, all water flows into the dam must be released to protect the structural safety of the dam.

The dam is relatively small with a total full supply storage volume of only 24800 megalitres, against an inflow volume during a 72 hour 1 in 50 year storm event of over 30000 megalitres. Flood gate operations at Leslie Harrison Dam do not impact on public roads and generally only inconvenience the general public during large flood events. Reductions in this inconvenience cannot be achieved by small reductions in dam storage level.

[redacted]

From: Dan Spiller
Sent: Friday, 24 December 2010 8:52 AM
To: Rob Drury
Cc: Mike Foster; Jim Pruss
Subject: RE: Technical Report W18

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: T3

Thanks for the update Rob.

My reading is that Lockyer flows mean that – regardless of dam operations – Twin Bridges, Savages Crossing and Colleges Crossing will be inundated at least until tomorrow and for longer if the forecast rainfall eventuates.

Did you consider an option of maximising dams releases while keeping Burtons Bridge open, given the lower level bridges are likely to be inundated combined with the dam remaining above FSL and the forecast of rainfall each day for the next week? I imagine this would mean that you could continue the current level of releases, or thereabouts.

Appreciate your advice.

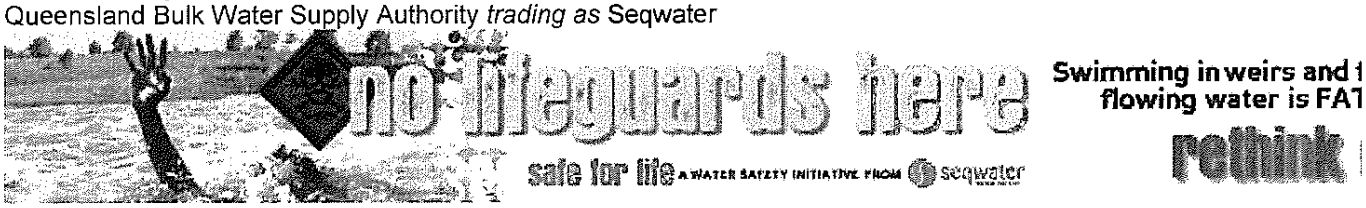
Regards,
Dan

From: Rob Drury [redacted]
Sent: Friday, 24 December 2010 6:49 AM
To: Dan Spiller
Cc: Mike Foster [redacted] Peter Borrows; Jim Pruss; [redacted]
Subject: Technical Report W18

Dan,
Wouldn't normally do one as no change from yesterday but thought would update adding the extra info at top you requested as a trial.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

From: Barry Dennien [redacted]
Sent: Friday, December 24, 2010 10:17 AM
To: [redacted]
Cc: Waldman Karen <[redacted]; Dan Spiller [redacted]
Subject: URGENT
Attach: Seqwater letter re Min s request on options for release of water.docx

---

[redacted]

See attached a letter we are planning to send to Seqwater giving our permission to lower Wivenhoe below full supply level down to 95% and North Pine to 97.5% for flood mitigation purposes. The is only for the current wet season.

We request the QWC note this proposed strategy and reply appropriately by midday today.

We apologise in advance for the short turnaround period. Current weather events have made us progress this issue.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
[redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Trim Ref: D/10/8129

24 December 2010

Mr Peter Borrows
Chief Executive Officer
Seqwater
PO Box 16146
City East Qld 4002

Dear Mr Borrows

I refer to our letter of _ regarding the request from Minister Stephen Robertson to consider options to, and the benefits of releasing water from key storages in anticipation of major inflows over the coming summer period.

As you are aware, your officers have since provided advice about options and benefits.

I advise that, from a water security perspective, the SEQ Water Grid Manager has no in principle objection to minor releases from Wivenhoe, Somerset and North Pine dams to minimise the operational and community impacts of gate releases. Specifically, we have no in principle objection to:

- Wivenhoe and Somerset dams being drawn down to 95 per cent of their combined full supply level
- North Pine Dam being drawn down to 97.5 per cent of its full supply level.

Any specific releases to below Full Supply Level should be approved by myself or, if I am not available, the Director of Operations, SEQ Water Grid Manager.

Any releases should be managed by Seqwater in accordance with any statutory and regulatory obligations, such as the flood operations manuals and Resource Operations Plan. We recommend that you liaise with the Department of Environment and Resource Management to confirm any conditions that apply.

I acknowledge that these releases would have a negligible impact on the extent and duration of flooding during a major flood event. However, they may provide the ability to minimise the community and operational impacts of minor releases.

We have assessed the water security implications of the release to be negligible, having no impact on our ability to meet the risk criteria specified in the *South East Queensland System Operating Plan* or our ability to meet our supply obligations to SEQ Water Grid customers.

From a water security perspective, I am advised that the Queensland Water Commission also does not have any objections to the proposed release.

Please note that these arrangements are intended to apply for the current wet season only, taking into account the level of storages and the rainfall forecasts over coming months.

I am keen to continue to work with you to investigate the optimal arrangements for future wet seasons. In particular, I am keen to work with you to further investigate options that may reduce the frequency or duration of intermediate level flows (between 1,900 and 3,500 cubic metres per second). In addition, we recommend that the investigations with the Queensland Water Commission to examine the opportunity of raising the full supply level of Wivenhoe Dam for increased water supply be expanded to include options to lower the full supply level for managing flood events.

Thank you for your assistance in this matter. If you have any questions, please do not hesitate to contact Mr Dan Spiller, Director of Operations, by telephone or [redacted] or via email at [redacted]

Yours sincerely

Barry Dennien
Chief Executive Officer

Litsupport Brisbane

From: Barry Dennien
Sent: Friday, 24 December 2010 10:59 AM
To: Dan Spiller
Subject: FW: URGENT
Attachments: Seqwater letter re Min s request on options for release of water.docx

---

From: [redacted]
Sent: Friday, 24 December 2010 10:59 AM
To: Barry Dennien
Cc: [redacted] Waldman Karen
Subject: FW: URGENT

To help with our response could you please provide the information provided from Seqwater on the options and benefits of the proposed release as referred to in your letter.

Regards

[redacted]
Director, Planning Projects
Regional Planning and Policy
Telephone: [redacted]
Email: [redacted]
www.qwc.qld.gov.au

Queensland Water Commission
53 Albert Street, Brisbane Q 4000
PO Box 15087, City East Q 4002

From: Barry Dennie[redacted]
Sent: Friday, 24 December 2010 10:17 AM
To: [redacted]
Cc: Waldman Karen; spiller daniel @ SEQWGM
Subject: URGENT

[redacted]

See attached a letter we are planning to send to Seqwater giving our permission to lower Wivenhoe below full supply level down to 95% and North Pine to 97.5% for flood mitigation purposes. The is only for the current wet season.

We request the QWC note this proposed strategy and reply appropriately by midday today.

We apologise in advance for the short turnaround period. Current weather events have made us progress this issue.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

****
The information in this email together with any attachments is intended only for the person or entity to which it is addressed and may contain confidential and/or privileged material.

Any form of review, disclosure, modification, distribution and/or publication of this email message is prohibited, unless as a necessary part of Departmental business.

If you have received this message in error, you are asked to inform the sender as quickly as possible and delete this message and any copies of this message from your computer and/or your computer system network.
****

Trim Ref: D/10/8129

24 December 2010

Mr Peter Borrows
Chief Executive Officer
Seqwater
PO Box 16146
City East Qld 4002

Dear Mr Borrows

I refer to our letter of regarding the request from Minister Stephen Robertson to consider options to, and the benefits of releasing water from key storages in anticipation of major inflows over the coming summer period.

As you are aware, your officers have since provided advice about options and benefits.

I advise that, from a water security perspective, the SEQ Water Grid Manager has no in principle objection to minor releases from Wivenhoe, Somerset and North Pine dams to minimise the operational and community impacts of gate releases. Specifically, we have no in principle objection to:

- Wivenhoe and Somerset dams being drawn down to 95 per cent of their combined full supply level
- North Pine Dam being drawn down to 97.5 per cent of its full supply level.

Any specific releases to below Full Supply Level should be approved by myself or, if I am not available, the Director of Operations, SEQ Water Grid Manager.

Any releases should be managed by Seqwater in accordance with any statutory and regulatory obligations, such as the flood operations manuals and Resource Operations Plan. We recommend that you liaise with the Department of Environment and Resource Management to confirm any conditions that apply.

I acknowledge that these releases would have a negligible impact on the extent and duration of flooding during a major flood event. However, they may provide the ability to minimise the community and operational impacts of minor releases.

We have assessed the water security implications of the release to be negligible, having no impact on our ability to meet the risk criteria specified in the *South East Queensland System Operating Plan* or our ability to meet our supply obligations to SEQ Water Grid customers.

From a water security perspective, I am advised that the Queensland Water Commission also does not have any objections to the proposed release.

Please note that these arrangements are intended to apply for the current wet season only, taking into account the level of storages and the rainfall forecasts over coming months.

I am keen to continue to work with you to investigate the optimal arrangements for future wet seasons. In particular, I am keen to work with you to further investigate options that may reduce the frequency or duration of intermediate level flows (between 1,900 and 3,500 cubic metres per second). In addition, we recommend that the investigations with the Queensland Water Commission to examine the opportunity of raising the full supply level of Wivenhoe Dam for increased water supply be expanded to include options to lower the full supply level for managing flood events.

Thank you for your assistance in this matter. If you have any questions, please do not hesitate to contact Mr Dan Spiller, Director of Operations, by telephone on [redacted] or via email at [redacted]

Yours sincerely

Barry Dennien
Chief Executive Officer

From: Barry Dennien [redacted]
Sent: Friday, December 24, 2010 11:04 AM
To: [redacted]
Cc: Dan Spiller [redacted] Waldman Karen [redacted]
Subject: RE: URGENT
Attach: Internal memo for Wivenhoe and Somerset December 2010 flood releases.docx

---

[redacted]

Our advice reflects Seqwater's advice and our joint experiences over the past weeks of flood releases.

Barry

From: [redacted]
Sent: Friday, 24 December 2010 10:59 AM
To: Barry Dennien
Cc: [redacted] Waldman Karen
Subject: FW: URGENT

To help with our response could you please provide the information provided from Seqwater on the options and benefits of the proposed release as referred to in your letter.

Regards

[redacted]
Director, Planning Projects
Regional Planning and Policy
[redacted]
www.qwc.qld.gov.au

Queensland Water Commission
53 Albert Street, Brisbane Q 4000
PO Box 15087, City East Q 4002

From: Barry Dennien [redacted]
Sent: Friday, 24 December 2010 10:17 AM
To: [redacted]
Cc: Waldman Karen; spiller daniel @ SEQWGM
Subject: URGENT

[redacted]

See attached a letter we are planning to send to Seqwater giving our permission to lower Wivenhoe below full supply level down to 95% and North Pine to 97.5% for flood mitigation purposes. The is only for the current wet season.

We request the QWC note this proposed strategy and reply appropriately by midday today.

We apologise in advance for the short turnaround period. Current weather events have made us progress this issue.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
[redacted]708
Email: [redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

****
The information in this email together with any attachments is intended only for the person or entity to which it is addressed and may contain confidential and/or privileged material.

Any form of review, disclosure, modification, distribution and/or publication of this email message is prohibited, unless as a necessary part of Departmental business.

If you have received this message in error, you are asked to inform the sender as quickly as possible and delete this message and any copies of this message from your computer and/or your computer system network.
****

SEQ Water Grid manager

Memorandum

TRIM reference: D/10/7970	**Date:**
To [redacted]	
From: Barry Dennien	
Subject: Water security modelling for Wivenhoe Dam flood releases	

Purpose

To seek in principle approval for water to be released from Wivenhoe and Somerset dams to 95 per cent (%) of storage capacity at any time until end March 2011.

Background

Minister Robertson wrote to our Chair on 25 October 2010 seeking advice regarding options to, and benefits of, releasing water from key SEQ Water Grid (Water Grid) storages in anticipation of major inflows over the coming summer (**Attachment 1**).

SEQ Water Grid Manager (WGM) officers have consulted with Seqwater regarding options and benefits of releasing water from key storages. Beyond the detailed advice outlined below, Seqwater officers have reiterated that Seqwater is confident of its ability to manage floods in accordance with the approved management plans and based on the existing Full Supply Level. While not necessary, Seqwater consider that in principle agreement to reduce storages to below Full Supply Level may provide operational advantages in some situations.

Relevant dams

In South East Queensland, Wivenhoe, Somerset, North Pine and Leslie Harrison dams are gated. Gates have also been installed as part of the Hinze Dam upgrade, which is scheduled to be completed by end January 2011. Other dams have a combination of small release valves and spillways and spill when above the Full Supply Level.

Gated dams provide an opportunity for water to be released to below the Full Supply Level in anticipation of future inflows.

Controlled releases impact upon downstream river levels, with the extent of impact dependent upon the amount releases. Controlled releases are only one of several factors that impact river levels, including tide and inflows downstream of the dam wall. For example, Wivenhoe and Somerset dams control only half of the Brisbane River catchment.

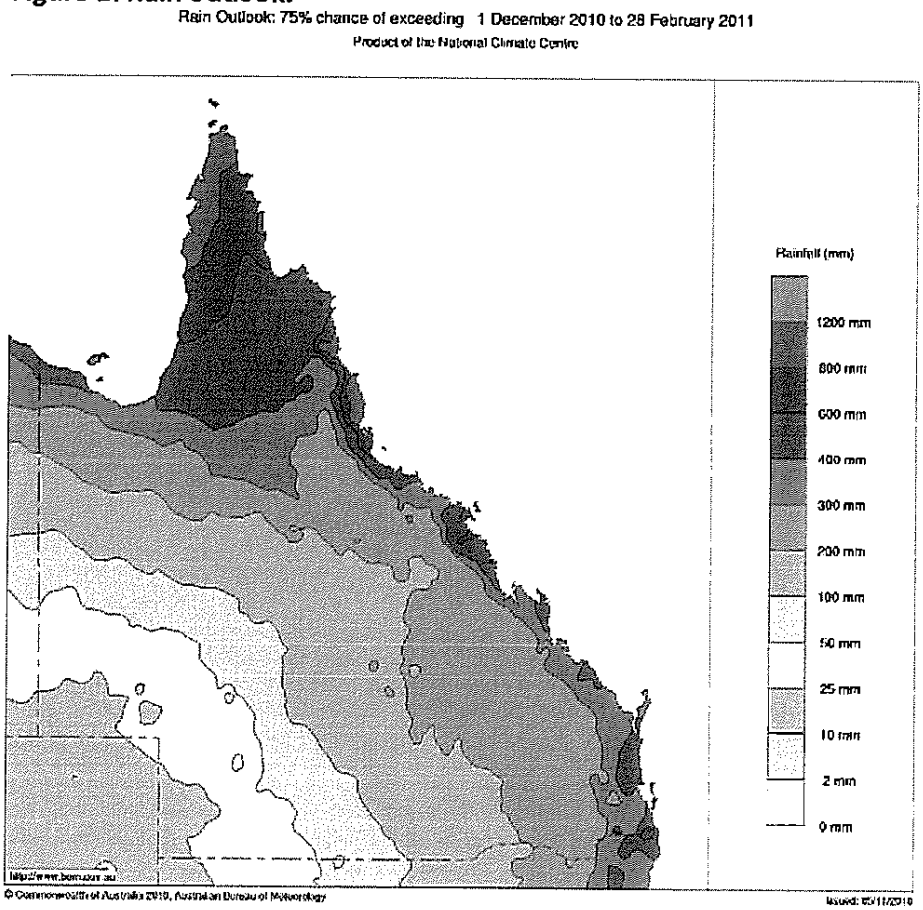
Probability of gate releases over the remainder of the wet season

Grid 12 storages are at 100% of combined capacity, with further rainfall forecast. The Bureau of Meteorology has advised that:

- heavy rainfall is likely across South East Queensland over the Christmas holiday period
- higher than average rainfall to continue over the remainder of the traditional wet season, with 75% probability of exceeding at least 300 millimetres of rainfall across South East Queensland from December 2010 to the end February 2011.

Any further rainfall is expected to result in significant inflows to storages, due to catchments being wet. With storages being full, these inflows will trigger managed releases from Wivenhoe, Somerset and North Pine dams.

Figure 1: Rain outlook.



Wivenhoe and Somerset dams: Medium to major flood events

Seqwater has advised that releases of greater than 3,500 cubic metres per second from Wivenhoe Dam are likely to impact on urban areas in Brisbane. Events of this nature have not been experienced since Wivenhoe Dam was completed in 1984.

Seqwater has advised that:

- Pre-emptive releases are likely to have negligible impacts on the extent of these impacts.
- Any impacts would require releases of at least 250,000 megalitres (ML). This is equivalent to a release of about 16% of the combined storage capacity of Wivenhoe and Somerset dams.

A pre-emptive release of this scale is not recommended, based on information currently available. The potential water security impacts are considered more significant than the negligible benefits. These potential security impacts include costs associated with the earlier or avoidable operation of the Gold Coast Desalination Plant (Desalination Plant) at capacity, as well as the increased probability of triggering the implementation of a drought response plan.

More detailed investigation of opportunities to manage flood storage is recommended, including options to increase flood supply level on a temporary basis. These investigations need to be led by Seqwater, and involve the Bureau of Meteorology, Councils and the Water Grid Manager.

Wivenhoe and Somerset dams: Minor flood events

Pre-emptive releases from Wivenhoe Dam may reduce the impacts of minor gate releases (strategies W1A to W1E in the operational procedures).

Minor gate releases may result in the closure of up to six bridges, isolating up to 50 dwellings and inconveniencing many more. As stated in existing flood management plans, releases should be managed to minimise the impacts on these residents. Over the immediate term, councils have requested that bridge closures be avoided over the Christmas to New Year period, if possible. In addition:

- There are resource implications involved in the activation of the flood control centre. Under flood management plans, the flood control centre must be staffed by suitability qualified officers at all times during gate releases. There are currently only four quality duty engineers who have staffed the flood centre for much of period since the initial release in October 2010.

- Gate releases during the Christmas holiday period would result in closure of dams to water based activities, impacting on up to 150,000 people who are expected to use the recreational facilities over the holiday period.

Recommendation

It is recommended that the WGM advise Seqwater that, from a water security perspective:

- in principle, we would not object to water being released from Wivenhoe and Somerset dams to 95% of storage capacity at any time until end March 2011
- any specific release should be endorsed by the Chief Executive Officer (CEO) or Director of Operations, prior to being made
- approval is for the existing wet season only and is subject to review prior to the 2011 wet season.

Under this recommendation, storage levels could potentially be reduced by up to about 77,250 ML. This is equivalent to the amount of water released between 13 and 16 December 2010, through a single gate.

Pre-emptive releases will be managed so as to minimise the likelihood of gate releases due to small storms and local rainfall. Storage capacity will usually be reduced through a combination of:

- Extended gate releases, especially for strategy W1C. For comparison, up to 130,000 ML per day was released during November 2010 and mid December 2010. At this rate, the additional releases could occur in approximately half a day.
- Ongoing gate releases of up to 30,000 ML per day, which would not isolate any residents but could inundate some lower bridges that cause inconvenience.
- Ongoing valve release of up to about 4,300 ML per day, which can be maintained without inundate any bridges.

Actual releases will be decided based on operational considerations.

The CEO and the Director of Operations will seek to ensure that storages are managed with the objective of being at Full Supply Level at the end of the wet season, in April 2011.

Water security impacts

The water security impacts of releases will be zero if the dams fill over the remainder of the wet season. Current forecasts indicate that there is a high probability of this occurring as:

- Heavy rainfall is forecast over the Christmas holiday period, as noted above.
- Over the remainder of the wet season, advice from the Bureau of Meteorology is that sea surface temperatures are likely to remain at levels typical of a La Niña event into the first quarter of 2011, with the majority of the models indicating the event will gradually weaken over the coming months.

The water security impacts will be minimal, even if there were no further inflows into the dams. Modelling indicates that the reduction would have a minimal impact on the probability of key Water Grid storages falling to 40% of capacity over the next five years.

Four cases were developed to assess the impact of the potential flood releases below Full Supply Level. Each was based on the model used to develop the October 2010 version of the Operating Strategy, with an update for the operation of the Desalination Plant. The outline of each case is shown below in **Table 1**.

The first two runs assess the difference in water security starting in January 2011 with storages at 100% and 95%. The second two cases assessed the scenario where dams were reduced to 95% and were not refilled this wet season, and therefore the simulation started in June 2011.

Table 1: Summary of models.

Case	Wivenhoe and Somerset dam level	Start month
1	100%	January 2011
2	95%	January 2011
3	100%	June 2011
4	95%	June 2011

Results show that the ability to meet the risk criteria stated in the South East Queensland System Operating Plan (SOP) (refer **Table 2**) is not affected by this change in supply level in January 2011. In addition, the difference in probability of Wivenhoe and Somerset dams refilling is negligible after six months. If releases are made to bring Wivenhoe and Somerset dams to 95% of combined storage, hydrologic modelling using stochastically generated inflows indicates that the point at which the probability of reaching 40% was brought forward by two months (refer **Figures 2 and 3**).

Table 2: SOP rules.

Trigger	1 year	3 years	5 years
T1	<0.2%	Not specified	<5%
T2	Not specified	<0.5%	<1%

Table 3: Current levels, starting January 2011 (case 1).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Table 4: Wivenhoe and Somerset dams at 95%, starting January 2011 (case 2).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Table 5: Current levels, starting June 2011 (case 3).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Table 6: Wivenhoe and Somerset dams at 95%, starting June 2011 (case 4).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Figure 2: Storage volume forecast Brisbane System (case 1).

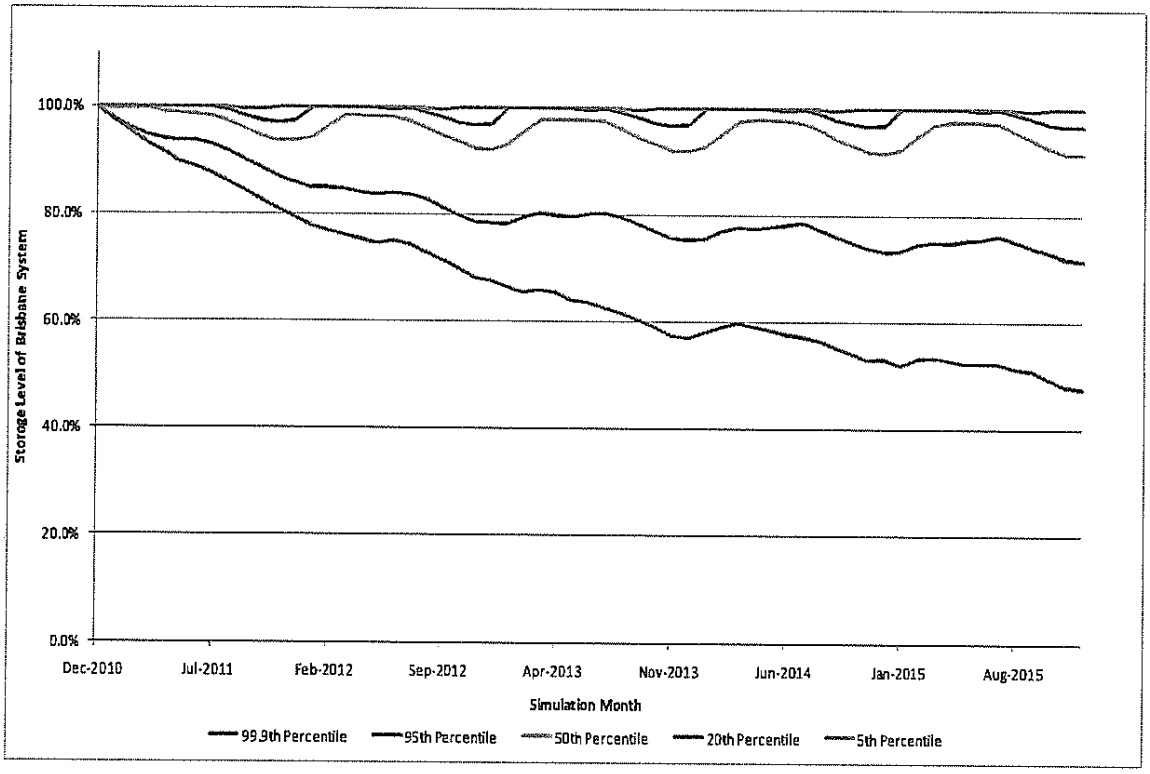


Figure 2: Storage volume forecast Brisbane System (case 2).

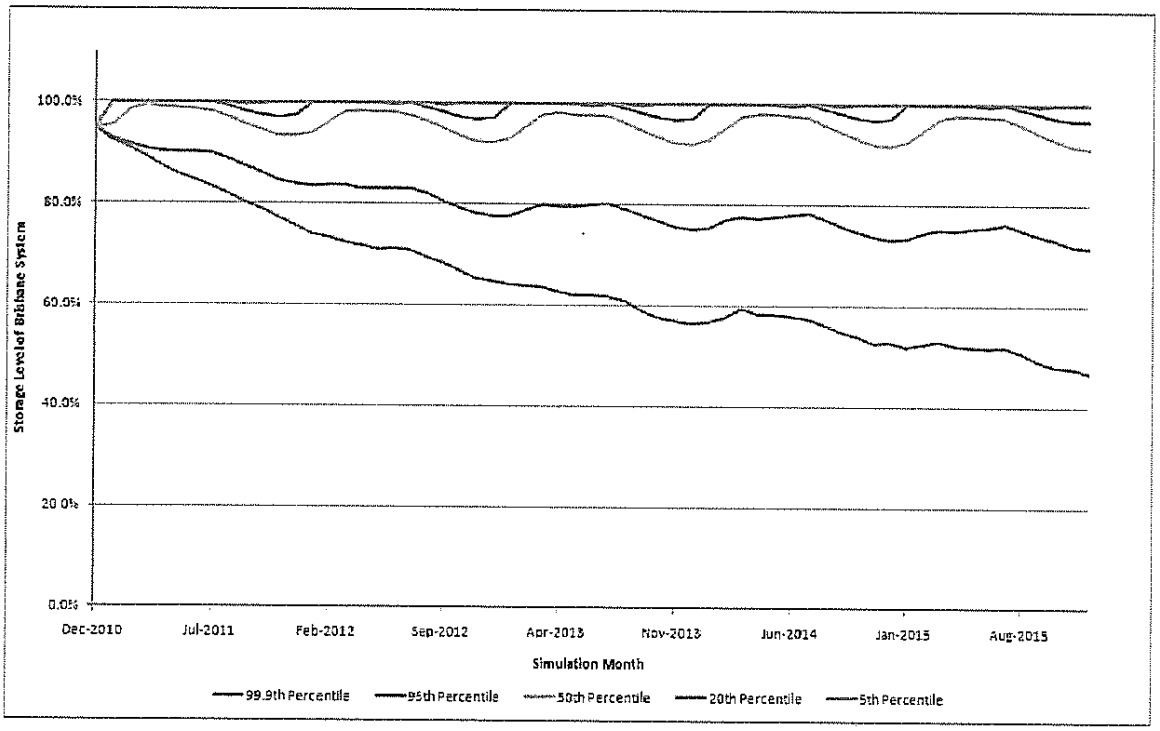


Figure 1 shows that, under the current case, 50% of long-term simulated inflow scenarios maintain the Brisbane System at full storage capacity over the next three months. With the release to 95% of Full Supply Level, 50% of simulated inflows return the dams to Full Supply Level in approximately four months.

As a worst case scenario, a scenario was run that reduced the Full Supply Level of Wivenhoe and Somerset dams to 95% of the current level for the full duration of the simulation (that is, a permanent reduction). This was undertaken to indicate the lower bound of results that could be expected when simulating the proposed dam release approach. Results for this scenario indicated that the probability of reaching 40% in the Brisbane System increased to 0.03% in five years, as compared to the base case of 0.01%.

North Pine and Leslie Harrison dams

North Pine and Leslie Harrison dams do not have flood mitigation potential. Once the dams have reached Full Supply Level, all water flows into the dam must be released to protect the structural safety of the dam.

Seqwater has advised that, without major releases, there are negligible benefits to reducing volumes stored in North Pine or Leslie Harrison dams for the purposes of reducing the extent or duration of any downstream flooding impacts.

For North Pine Dam, there may be some operational and community benefits to minor releases to below Full Supply Level in some circumstances. Any gate operation at North Pine Dam results in inundation of Youngs Crossing Road, which isolates a number of residents. These impacts are currently being minimised by releasing from North Pine Dam at night. With further rainfall forecast, Seqwater may choose to reduce the level to below Full Supply Level in order to reduce the frequency of night releases or the likelihood of releases being required during the day.

For this dam, it is recommended that the WGM advise Seqwater that, from a water security perspective:

- in principle, it would not object to water being released to 97.5% of storage capacity at any time until end March 2011
- any specific release should be endorsed by the CEO or Director of Operations prior to being made
- approval is for the existing wet season only, subject to review prior to the 2011 wet season.

For Leslie Harrison Dam, gate operations do not impact on public roads and generally only inconvenience the general public during large flood events. There is no scope to reduce this inconvenience through small pre-emptive releases. Accordingly, it is recommended that no in-principle approval be made for pre-emptive releases from this dam.

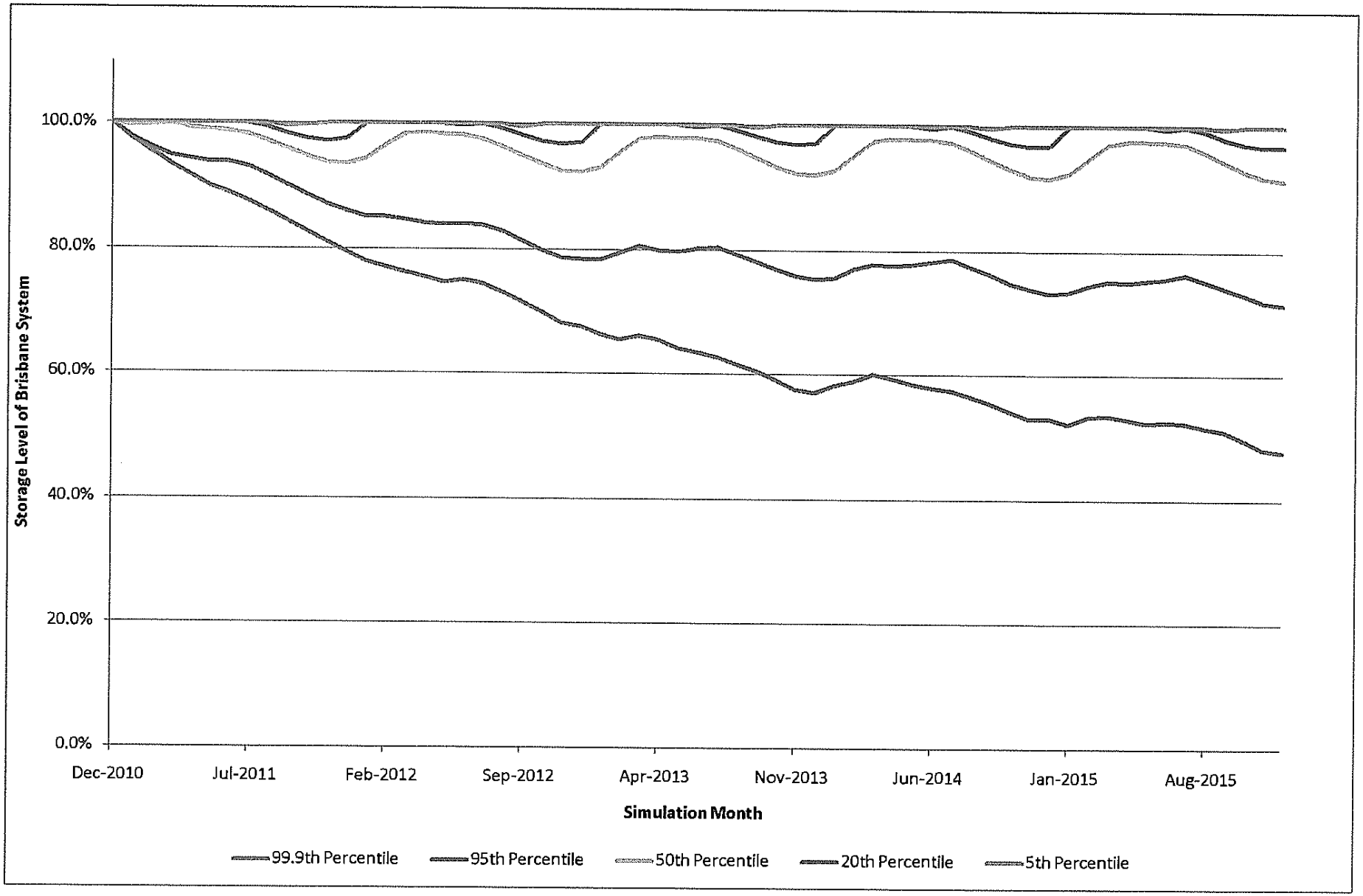
Summary of recommendations

It is recommended that the SEQ Water Grid Manager Board (Board) approve that:

- from a water security perspective, it would not object to water being released from Wivenhoe and Somerset dams to 95% of the Full Storage Level at any time until end March 2011
- from a water security perspective, it would not object to water being released from North Pine Dam to 97.5% of the Full Storage Level at any time until end March 2011
- any specific release should be endorsed by the CEO or Director of Operations prior to being made
- approval is for the existing wet season only, subject to review prior to the 2011 wet season.

The proposed letter from the Chair forms **Attachment 2**.

This advice is consistent with the verbal briefing provided to Minister Robertson at the 13 December 2010 Board meeting. The response to Minister Robertson will reflect this advice (refer **Attachment 3**).


Storage Level of Brisbane System
100.0%
80.0%
60.0%
40.0%
20.0%
0.0%
Dec-2010
Jul-2011
Feb-2012
Sep-2012
Apr-2013
Nov-2013
Jun-2014
Jan-2015
Aug-2015
Simulation Month
99.9th Percentile
95th Percentile
50th Percentile
20th Percentile
5th Percentile

Copy Data from WathNet Model and paste in yellow cells
Case 1 - Current, Jan 2011

Projection	Simulation		Stor			
Month	W. Year	W. Month	0.1th Percentile	4.th Percentile	5th Percentile	10.th Percentile
0	1	6	1545050	1545050	1545050	1545050
1	1	7	1545050	1545050	1545050	1545050
2	1	8	1545050	1545050	1545050	1545050
3	1	9	1545050	1545050	1545050	1545050
4	1	10	1545050	1545050	1545050	1545050
5	1	11	1545050	1545050	1545050	1545050
6	1	12	1545050	1545050	1545050	1545050
7	2	1	1545050	1545050	1545050	1545050
8	2	2	1545050	1545050	1545050	1544574
9	2	3	1545050	1542678.125	1539825	1532568
10	2	4	1545050	1545050	1542065	1528953
11	2	5	1545050	1545050	1545050	1528813
12	2	6	1545050	1545050	1545050	1538306
13	2	7	1545050	1545050	1545050	1545050
14	2	8	1545050	1545050	1545050	1545050
15	2	9	1545050	1545050	1545050	1545050
16	2	10	1545050	1545050	1545050	1545050
17	2	11	1545050	1545050	1545050	1545050
18	2	12	1545050	1545050	1545050	1545050
19	3	1	1545050	1545050	1545050	1545050
20	3	2	1545050	1545050	1545050	1544650
21	3	3	1545050	1541330.125	1539502	1531271
22	3	4	1545050	1545050	1545050	1528212
23	3	5	1545050	1545050	1545050	1527279
24	3	6	1545050	1545050	1545050	1534058
25	3	7	1545050	1545050	1545050	1545050
26	3	8	1545050	1545050	1545050	1545050
27	3	9	1545050	1545050	1545050	1545050
28	3	10	1545050	1545050	1545050	1545050
29	3	11	1545050	1545050	1545050	1545050
30	3	12	1545050	1545050	1545050	1545050
31	4	1	1545050	1545050	1545050	1545050
32	4	2	1545050	1545050	1545050	1544798
33	4	3	1545050	1542573.25	1540384	1532355
34	4	4	1545050	1545050	1545050	1530635
35	4	5	1545050	1545050	1545050	1530032
36	4	6	1545050	1545050	1545050	1535489
37	4	7	1545050	1545050	1545050	1545050
38	4	8	1545050	1545050	1545050	1545050

39	4	9	1545050	1545050	1545050	1545050
40	4	10	1545050	1545050	1545050	1545050
41	4	11	1545050	1545050	1545050	1545050
42	4	12	1545050	1545050	1545050	1545050
43	5	1	1545050	1545050	1545050	1545050
44	5	2	1545050	1545050	1545050	1544759
45	5	3	1545050	1542415.5	1540480	1531930
46	5	4	1545050	1545050	1545050	1530967
47	5	5	1545050	1545050	1545050	1528873
48	5	6	1545050	1545050	1545050	1533443
49	5	7	1545050	1545050	1545050	1545050
50	5	8	1545050	1545050	1545050	1545050
51	5	9	1545050	1545050	1545050	1545050
52	5	10	1545050	1545050	1545050	1545050
53	5	11	1545050	1545050	1545050	1545050
54	5	12	1545050	1545050	1545050	1545050
55	6	1	1545050	1545050	1545050	1545050
56	6	2	1545050	1545050	1545050	1545050
57	6	3	1545050	1542475.25	1540519	1532327
58	6	4	1545050	1545050	1545050	1530314
59	6	5	1545050	1545050	1545050	1529130
60	6	6	1545050	1545050	1545050	1533858

age Volume Forecast Data (ML)						
20th Percentile	50th Percentile	80th Percentile	90.th Percentile	95th Percentile	96.th Percentile	99.9th Percentile
1545050	1545050	1545050	1545050	1545050	1545050	1545050
1545050	1539638	1518836	1513662	1511223	1510664	1506020
1545050	1540744	1510508	1493720	1484897	1483402	1474792.5
1545050	1545050	1502507	1483021	1465229	1461255	1442793.75
1545050	1534753	1498969	1476448	1456751	1449961	1416528
1545050	1530776	1496554	1471438	1449554	1443526	1390184.25
1545050	1526077	1495099	1470195	1448309	1441473	1372992.25
1545050	1518678	1486832	1461280	1438310	1432301	1352234.25
1535385	1502045	1465566	1440196	1416639	1410335	1329581
1519509	1482374	1440073	1415695	1391978	1385641	1302654.625
1507711	1464396	1415362	1391491	1368593	1362289	1277835.625
1501879	1448803	1392092	1368448	1345450	1338758	1252291.875
1508601	1446191	1379659	1352607	1329650	1321429	1229027.75
1545050	1458858	1375230	1340178	1315071	1308403	1204347.25
1545050	1492399	1389143	1344174	1313856	1305601	1192322.375
1545050	1520992	1401467	1346800	1308820	1298879	1178327.875
1545050	1523810	1405304	1338452	1299550	1288015	1167335.875
1545050	1518874	1409583	1338987	1296861	1285348	1153819.125
1542004	1517300	1419169	1345247	1297970	1286155	1160466.25
1545050	1508404	1428096	1351797	1295487	1282412	1151064.125
1533649	1488515	1409189	1334086	1279378	1264661	1128739.5
1517421	1466974	1388407	1316168	1257474	1243460	1105785.125
1503828	1446946	1368254	1297359	1234765	1222080	1081926.375
1496318	1430149	1351080	1282014	1215835	1203059	1054723.75
1501616	1427345	1343785	1275252	1212692	1193549	1045164.125
1545050	1439460	1340173	1276898	1211378	1192663	1026403.188
1545050	1476971	1355708	1295028	1229984	1208616	1013670.938
1545050	1511592	1370915	1304476	1245343	1221668	1022241.75
1545050	1516572	1369835	1298844	1236205	1215306	1012328.625
1545050	1512537	1372302	1296984	1232565	1214467	991627.0625
1540705	1512355	1384716	1303591	1240433	1218522	982446.8125
1545050	1506101	1399445	1310666	1244204	1226503	969808.9375
1533323	1486174	1382501	1294793	1226878	1209387	952502.5625
1517807	1463641	1361779	1276290	1208281	1188663	936702.5
1505294	1442922	1343327	1258363	1190297	1169011	914222.75
1498096	1426228	1327527	1245374	1174256	1151118	890166.3125
1501569	1422788	1324610	1241411	1165823	1145202	881955
1545050	1435083	1323103	1245730	1169204	1144884	899612.25
1545050	1471248	1340102	1268611	1192196	1170975	911751.3125

1545050	1507478	1355631	1281557	1203610	1177289	928966.1875
1545050	1515317	1353843	1277648	1199094	1173002	917199.875
1545050	1513107	1358340	1276742	1203490	1175447	905180.0625
1539363	1511350	1368848	1281487	1209663	1186120	895265.5
1545050	1504899	1382599	1288410	1215963	1190136	888531.3125
1533118	1483647	1366869	1271051	1196992	1174503	874146.4375
1516579	1460577	1347880	1252082	1178463	1154104	856650.25
1503480	1438971	1329664	1234023	1157356	1133717	837875.9375
1495937	1421317	1313227	1217779	1144072	1122023	819107.125
1498755	1416571	1307618	1208998	1133049	1115887	821814.25
1545050	1428631	1312377	1213047	1135402	1113868	806106.375
1545050	1465392	1327575	1239725	1152764	1134122	824437.75
1545050	1500963	1338187	1250686	1163648	1138879	826981.5625
1545050	1509109	1335124	1249846	1159912	1135295	818793.3125
1545050	1509069	1337553	1249621	1166131	1137311	810222.5
1539231	1507778	1346322	1253078	1169920	1144723	813166.125
1545050	1502953	1359632	1262261	1180080	1155862	810286.5625
1533507	1481457	1342213	1244919	1163777	1143326	797700.25
1516875	1458270	1322886	1225795	1147275	1126244	790380.4375
1503909	1436557	1304153	1206579	1130255	1105497	768519.5625
1495971	1418790	1289344	1190680	1113397	1087761	745484.5625
1497356	1412857	1286870	1186665	1105636	1085201	739780.1875

	5th Percentile as %	20th Percentile as %	50th Percentile as %	95th Percentile as %
Dec-2010	100.0%	100.0%	100.0%	100.0%
Jan-2011	100.0%	100.0%	99.6%	97.8%
Feb-2011	100.0%	100.0%	99.7%	96.1%
Mar-2011	100.0%	100.0%	100.0%	94.8%
Apr-2011	100.0%	100.0%	99.3%	94.3%
May-2011	100.0%	100.0%	99.1%	93.8%
Jun-2011	100.0%	100.0%	98.8%	93.7%
Jul-2011	100.0%	100.0%	98.3%	93.1%
Aug-2011	100.0%	99.4%	97.2%	91.7%
Sep-2011	99.7%	98.3%	95.9%	90.1%
Oct-2011	99.8%	97.6%	94.8%	88.6%
Nov-2011	100.0%	97.2%	93.8%	87.1%
Dec-2011	100.0%	97.6%	93.6%	86.1%
Jan-2012	100.0%	100.0%	94.4%	85.1%
Feb-2012	100.0%	100.0%	96.6%	85.0%
Mar-2012	100.0%	100.0%	98.4%	84.7%
Apr-2012	100.0%	100.0%	98.6%	84.1%
May-2012	100.0%	100.0%	98.3%	83.9%
Jun-2012	100.0%	99.8%	98.2%	84.0%
Jul-2012	100.0%	100.0%	97.6%	83.8%
Aug-2012	100.0%	99.3%	96.3%	82.8%
Sep-2012	99.6%	98.2%	94.9%	81.4%
Oct-2012	100.0%	97.3%	93.7%	79.9%
Nov-2012	100.0%	96.8%	92.6%	78.7%
Dec-2012	100.0%	97.2%	92.4%	78.5%
Jan-2013	100.0%	100.0%	93.2%	78.4%
Feb-2013	100.0%	100.0%	95.6%	79.6%
Mar-2013	100.0%	100.0%	97.8%	80.6%
Apr-2013	100.0%	100.0%	98.2%	80.0%
May-2013	100.0%	100.0%	97.9%	79.8%
Jun-2013	100.0%	99.7%	97.9%	80.3%
Jul-2013	100.0%	100.0%	97.5%	80.5%
Aug-2013	100.0%	99.2%	96.2%	79.4%
Sep-2013	99.7%	98.2%	94.7%	78.2%
Oct-2013	100.0%	97.4%	93.4%	77.0%
Nov-2013	100.0%	97.0%	92.3%	76.0%
Dec-2013	100.0%	97.2%	92.1%	75.5%
Jan-2014	100.0%	100.0%	92.9%	75.7%
Feb-2014	100.0%	100.0%	95.2%	77.2%

Mar-2014	100.0%	100.0%	97.6%	77.9%
Apr-2014	100.0%	100.0%	98.1%	77.6%
May-2014	100.0%	100.0%	97.9%	77.9%
Jun-2014	100.0%	99.6%	97.8%	78.3%
Jul-2014	100.0%	100.0%	97.4%	78.7%
Aug-2014	100.0%	99.2%	96.0%	77.5%
Sep-2014	99.7%	98.2%	94.5%	76.3%
Oct-2014	100.0%	97.3%	93.1%	74.9%
Nov-2014	100.0%	96.8%	92.0%	74.0%
Dec-2014	100.0%	97.0%	91.7%	73.3%
Jan-2015	100.0%	100.0%	92.5%	73.5%
Feb-2015	100.0%	100.0%	94.8%	74.6%
Mar-2015	100.0%	100.0%	97.1%	75.3%
Apr-2015	100.0%	100.0%	97.7%	75.1%
May-2015	100.0%	100.0%	97.7%	75.5%
Jun-2015	100.0%	99.6%	97.6%	75.7%
Jul-2015	100.0%	100.0%	97.3%	76.4%
Aug-2015	100.0%	99.3%	95.9%	75.3%
Sep-2015	99.7%	98.2%	94.4%	74.3%
Oct-2015	100.0%	97.3%	93.0%	73.2%
Nov-2015	100.0%	96.8%	91.8%	72.1%
Dec-2015	100.0%	96.9%	91.4%	71.6%

99.9th Percentile as %
100.0%
97.5%
95.5%
93.4%
91.7%
90.0%
88.9%
87.5%
86.1%
84.3%
82.7%
81.1%
79.5%
77.9%
77.2%
76.3%
75.6%
74.7%
75.1%
74.5%
73.1%
71.6%
70.0%
68.3%
67.6%
66.4%
65.6%
66.2%
65.5%
64.2%
63.6%
62.8%
61.6%
60.6%
59.2%
57.6%
57.1%
58.2%
59.0%

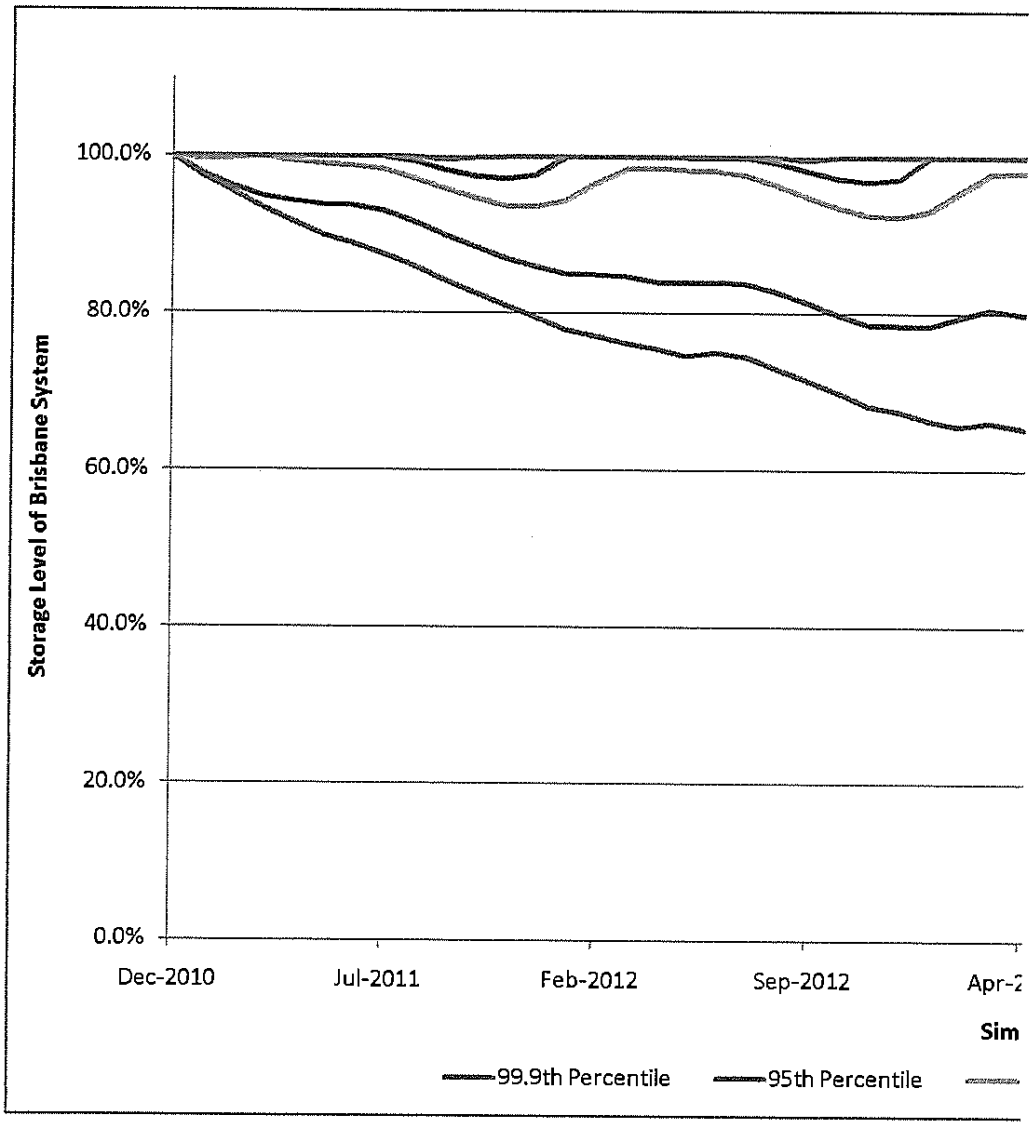
2013

60.1%
59.4%
58.6%
57.9%
57.5%
56.6%
55.4%
54.2%
53.0%
53.2%
52.2%
53.4%
53.5%
53.0%
52.4%
52.6%
52.4%
51.6%
51.2%
49.7%
48.2%
47.9%

2014

2015

Brisbane System drawdown curve - (

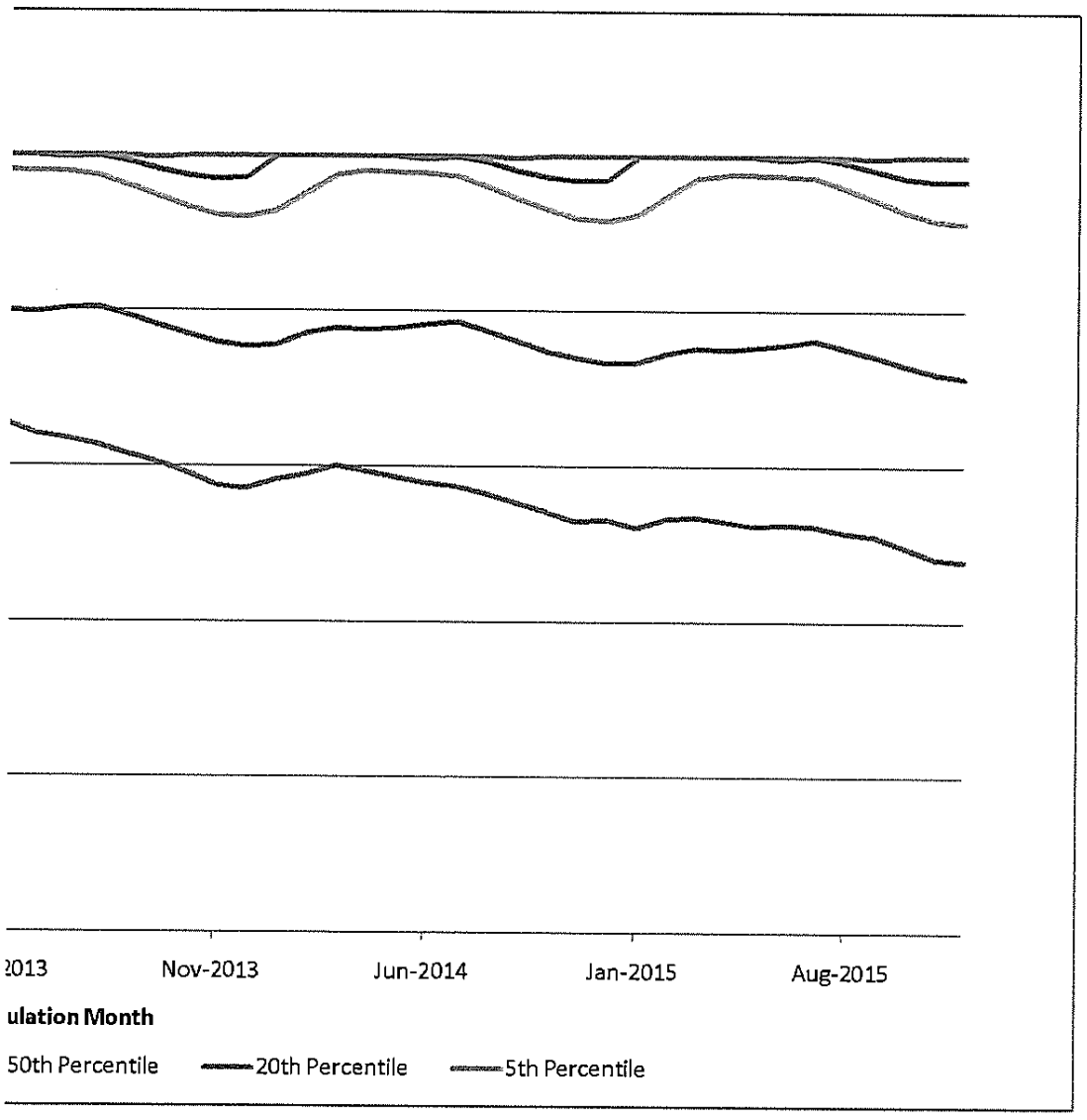


SEQ Regional Volume

Dam	**Volume**

LND	6671
Hinze	161073
LHD	24800
Somerset	379850
Wivenhoe	1165200
North Pine	215000
L Kurwongbah	15480
E Maddock	16700
Cooloolabin	14200
Wappa	4615
Baroon Pocket	61000
Lake MacDonald	8000
TOTAL	**2072589**

current levels



Copy Data from WathNet Model and paste in yellow cells
Case 2 - Wiv and Some 95%, Jan 2011

Projection	Simulation		Stor			
Month	W. Year	W. Month	0.1th Percentile	4.th Percentile	5th Percentile	10.th Percentile
0	1	6	1467797.5	1467797.5	1467798	1467798
1	1	7	1545050	1545050	1545050	1545050
2	1	8	1545050	1545050	1545050	1545050
3	1	9	1545050	1545050	1545050	1545050
4	1	10	1545050	1545050	1545050	1545050
5	1	11	1545050	1545050	1545050	1545050
6	1	12	1545050	1545050	1545050	1545050
7	2	1	1545050	1545050	1545050	1545050
8	2	2	1545050	1545050	1545050	1544407
9	2	3	1545050	1542232.625	1539515	1532234
10	2	4	1545050	1545050	1541592	1528424
11	2	5	1545050	1545050	1545050	1527929
12	2	6	1545050	1545050	1545050	1537916
13	2	7	1545050	1545050	1545050	1545050
14	2	8	1545050	1545050	1545050	1545050
15	2	9	1545050	1545050	1545050	1545050
16	2	10	1545050	1545050	1545050	1545050
17	2	11	1545050	1545050	1545050	1545050
18	2	12	1545050	1545050	1545050	1545050
19	3	1	1545050	1545050	1545050	1545050
20	3	2	1545050	1545050	1545050	1544597
21	3	3	1545050	1541307.875	1539469	1531246
22	3	4	1545050	1545050	1545050	1528125
23	3	5	1545050	1545050	1545050	1527038
24	3	6	1545050	1545050	1545050	1533814
25	3	7	1545050	1545050	1545050	1545050
26	3	8	1545050	1545050	1545050	1545050
27	3	9	1545050	1545050	1545050	1545050
28	3	10	1545050	1545050	1545050	1545050
29	3	11	1545050	1545050	1545050	1545050
30	3	12	1545050	1545050	1545050	1545050
31	4	1	1545050	1545050	1545050	1545050
32	4	2	1545050	1545050	1545050	1544788
33	4	3	1545050	1542550.75	1540352	1532317
34	4	4	1545050	1545050	1545050	1530498
35	4	5	1545050	1545050	1545050	1530032
36	4	6	1545050	1545050	1545050	1535480
37	4	7	1545050	1545050	1545050	1545050
38	4	8	1545050	1545050	1545050	1545050

39	4	9	1545050	1545050	1545050	1545050
40	4	10	1545050	1545050	1545050	1545050
41	4	11	1545050	1545050	1545050	1545050
42	4	12	1545050	1545050	1545050	1545050
43	5	1	1545050	1545050	1545050	1545050
44	5	2	1545050	1545050	1545050	1544747
45	5	3	1545050	1542415.5	1540441	1531930
46	5	4	1545050	1545050	1545050	1530953
47	5	5	1545050	1545050	1545050	1528873
48	5	6	1545050	1545050	1545050	1533343
49	5	7	1545050	1545050	1545050	1545050
50	5	8	1545050	1545050	1545050	1545050
51	5	9	1545050	1545050	1545050	1545050
52	5	10	1545050	1545050	1545050	1545050
53	5	11	1545050	1545050	1545050	1545050
54	5	12	1545050	1545050	1545050	1545050
55	6	1	1545050	1545050	1545050	1545050
56	6	2	1545050	1545050	1545050	1545050
57	6	3	1545050	1542475.25	1540519	1532327
58	6	4	1545050	1545050	1545050	1530314
59	6	5	1545050	1545050	1545050	1529130
60	6	6	1545050	1545050	1545050	1533830

age Volume Forecast Data (ML)						
20th Percentile	50th Percentile	80th Percentile	90.th Percentile	95th Percentile	96.th Percentile	99.9th Percentile
1467798	1467798	1467798	1467798	1467798	1467798	1467797.5
1545050	1474075	1442303	1437175	1434784	1434259	1430041
1545050	1522784	1438973	1421215	1416484	1415556	1408363.125
1545050	1540237	1450606	1416672	1402107	1398669	1377957.75
1545050	1532095	1461930	1416384	1395201	1388341	1351313.375
1545050	1527781	1472555	1420459	1392205	1384730	1325687.125
1545050	1524221	1477232	1427280	1394570	1386247	1306786.625
1545050	1516187	1473018	1427074	1388668	1380476	1286693.375
1535001	1498525	1453080	1407963	1370513	1362125	1264775.25
1518887	1479030	1428937	1386469	1350279	1340278	1241109.125
1506875	1460757	1405288	1366600	1328760	1318896	1217020.5
1500548	1444442	1382510	1347950	1306830	1295093	1193743.5
1506421	1442627	1370841	1335563	1296472	1283195	1170646.375
1545050	1454521	1366686	1325950	1289356	1276703	1145408.125
1545050	1489165	1381300	1332579	1294826	1282784	1132866.25
1545050	1518746	1393865	1336497	1292943	1281468	1118093.875
1545050	1522516	1397286	1329364	1283316	1270324	1107530.875
1545050	1517838	1402524	1330134	1283912	1271297	1097598
1541701	1516577	1413367	1334849	1283499	1269021	1101637.25
1545050	1507868	1422030	1340653	1283900	1270448	1095813
1533315	1487646	1404599	1325302	1267470	1250617	1072347.5
1517186	1466229	1382877	1305686	1245393	1229340	1053347.375
1503467	1446150	1364166	1288276	1224152	1209017	1032395.75
1496039	1429092	1346817	1273412	1206463	1192568	1008099.625
1501205	1426280	1341010	1267881	1199909	1182772	1002257.438
1544917	1438244	1336948	1270260	1201602	1178411	992382.75
1545050	1475984	1352425	1291047	1220141	1196239	988040.0625
1545050	1510854	1369105	1298796	1234965	1213112	985363.6875
1545050	1516260	1367990	1294315	1229451	1208844	969672.625
1545050	1512039	1369295	1291309	1228796	1206190	959961.625
1540649	1512031	1381890	1299158	1235389	1214417	960223.125
1545050	1505932	1397711	1307302	1240159	1218610	953697.875
1533243	1485796	1380948	1290197	1222519	1202156	939538.25
1517757	1463044	1359610	1272439	1202923	1184238	913574.5625
1505230	1442653	1341911	1256417	1185041	1163237	891334.875
1497996	1425839	1326084	1242508	1169789	1146579	882449.5
1501447	1422179	1322988	1237757	1161873	1139408	872122.5625
1545050	1434706	1321686	1243295	1165287	1141752	876627.5
1545050	1470876	1338167	1266875	1188906	1168329	891155

1545050	1507100	1354657	1280066	1199641	1174016	918250.4375
1545050	1514808	1353046	1276233	1194071	1168754	900848
1545050	1513045	1357278	1274202	1201336	1171411	900888.625
1539272	1511183	1367700	1279804	1205623	1181669	895265.5
1545050	1504716	1382137	1286462	1212591	1186361	888531.3125
1533110	1483568	1366220	1270320	1195501	1171087	871221.875
1516572	1460465	1346805	1250895	1173866	1152054	849037.625
1503358	1438783	1328962	1232376	1154189	1132215	834652.75
1495806	1421080	1311702	1216809	1140675	1119271	814451.375
1498712	1416409	1306349	1207716	1129729	1114535	814866.5625
1545050	1428368	1311808	1211850	1133001	1111216	803028.625
1545050	1465160	1327103	1238730	1152347	1131137	807783.375
1545050	1500650	1337877	1249851	1161727	1136958	820654.875
1545050	1508980	1334644	1249341	1158829	1134094	805912.625
1545050	1508933	1337057	1249292	1164274	1135742	802746
1539231	1507712	1345464	1252334	1167568	1142220	800501.75
1545050	1502926	1359028	1261751	1179479	1153072	802951.75
1533500	1481341	1341784	1243683	1163543	1141107	783592.4375
1516861	1458150	1322737	1225257	1144893	1124190	759736.1875
1503844	1436485	1303967	1205809	1128826	1104948	742188.0625
1495897	1418735	1289098	1189718	1112287	1086829	738906.8125
1497321	1412688	1286813	1185593	1104858	1082654	724104.75

	5th Percentile as %	20th Percentile as %	50th Percentile as %	95th Percentile as %
Dec-2010	95.0%	95.0%	95.0%	95.0%
Jan-2011	100.0%	100.0%	95.4%	92.9%
Feb-2011	100.0%	100.0%	98.6%	91.7%
Mar-2011	100.0%	100.0%	99.7%	90.7%
Apr-2011	100.0%	100.0%	99.2%	90.3%
May-2011	100.0%	100.0%	98.9%	90.1%
Jun-2011	100.0%	100.0%	98.7%	90.3%
Jul-2011	100.0%	100.0%	98.1%	89.9%
Aug-2011	100.0%	99.3%	97.0%	88.7%
Sep-2011	99.6%	98.3%	95.7%	87.4%
Oct-2011	99.8%	97.5%	94.5%	86.0%
Nov-2011	100.0%	97.1%	93.5%	84.6%
Dec-2011	100.0%	97.5%	93.4%	83.9%
Jan-2012	100.0%	100.0%	94.1%	83.5%
Feb-2012	100.0%	100.0%	96.4%	83.8%
Mar-2012	100.0%	100.0%	98.3%	83.7%
Apr-2012	100.0%	100.0%	98.5%	83.1%
May-2012	100.0%	100.0%	98.2%	83.1%
Jun-2012	100.0%	99.8%	98.2%	83.1%
Jul-2012	100.0%	100.0%	97.6%	83.1%
Aug-2012	100.0%	99.2%	96.3%	82.0%
Sep-2012	99.6%	98.2%	94.9%	80.6%
Oct-2012	100.0%	97.3%	93.6%	79.2%
Nov-2012	100.0%	96.8%	92.5%	78.1%
Dec-2012	100.0%	97.2%	92.3%	77.7%
Jan-2013	100.0%	100.0%	93.1%	77.8%
Feb-2013	100.0%	100.0%	95.5%	79.0%
Mar-2013	100.0%	100.0%	97.8%	79.9%
Apr-2013	100.0%	100.0%	98.1%	79.6%
May-2013	100.0%	100.0%	97.9%	79.5%
Jun-2013	100.0%	99.7%	97.9%	80.0%
Jul-2013	100.0%	100.0%	97.5%	80.3%
Aug-2013	100.0%	99.2%	96.2%	79.1%
Sep-2013	99.7%	98.2%	94.7%	77.9%
Oct-2013	100.0%	97.4%	93.4%	76.7%
Nov-2013	100.0%	97.0%	92.3%	75.7%
Dec-2013	100.0%	97.2%	92.0%	75.2%
Jan-2014	100.0%	100.0%	92.9%	75.4%
Feb-2014	100.0%	100.0%	95.2%	76.9%

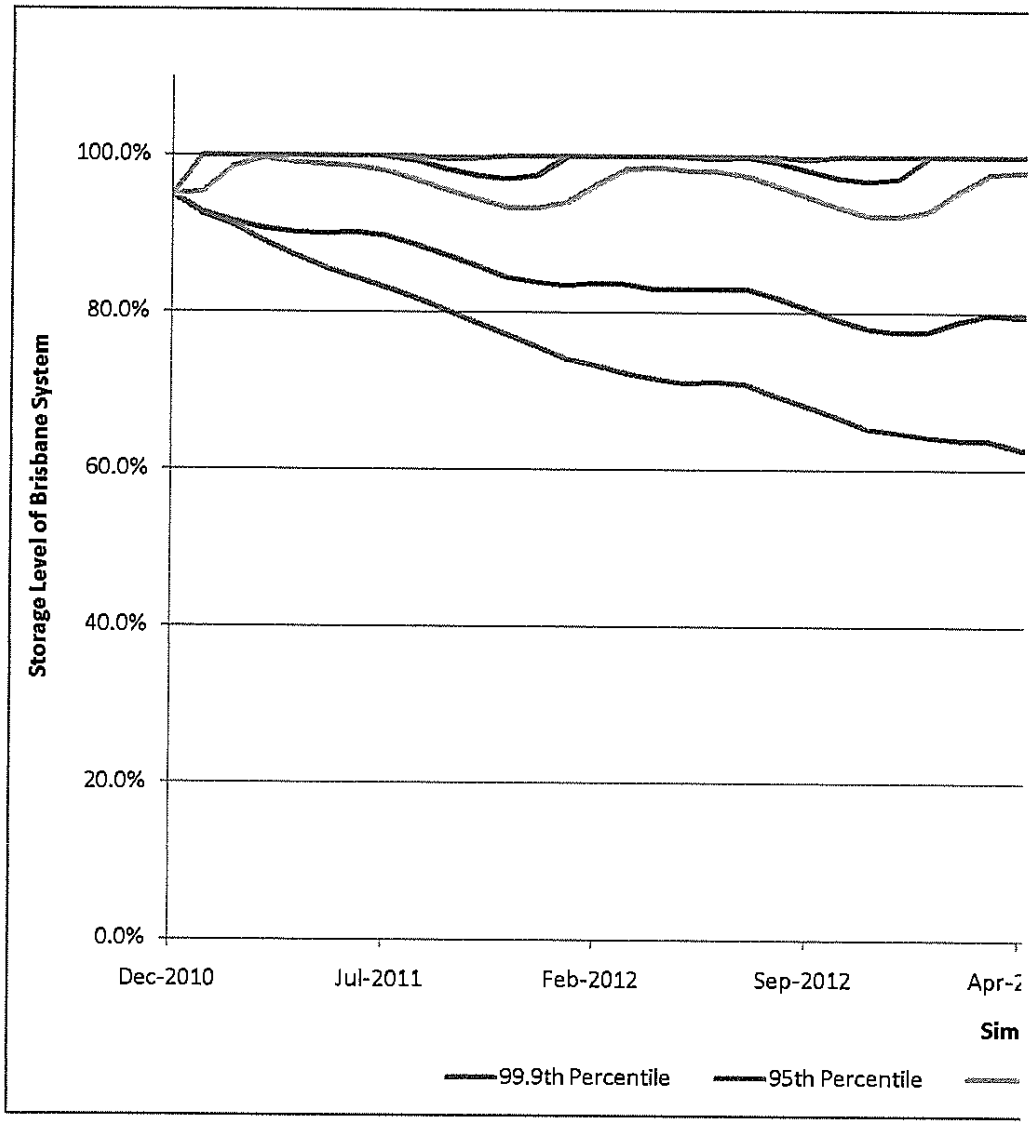
Mar-2014	100.0%	100.0%	97.5%	77.6%
Apr-2014	100.0%	100.0%	98.0%	77.3%
May-2014	100.0%	100.0%	97.9%	77.8%
Jun-2014	100.0%	99.6%	97.8%	78.0%
Jul-2014	100.0%	100.0%	97.4%	78.5%
Aug-2014	100.0%	99.2%	96.0%	77.4%
Sep-2014	99.7%	98.2%	94.5%	76.0%
Oct-2014	100.0%	97.3%	93.1%	74.7%
Nov-2014	100.0%	96.8%	92.0%	73.8%
Dec-2014	100.0%	97.0%	91.7%	73.1%
Jan-2015	100.0%	100.0%	92.4%	73.3%
Feb-2015	100.0%	100.0%	94.8%	74.6%
Mar-2015	100.0%	100.0%	97.1%	75.2%
Apr-2015	100.0%	100.0%	97.7%	75.0%
May-2015	100.0%	100.0%	97.7%	75.4%
Jun-2015	100.0%	99.6%	97.6%	75.6%
Jul-2015	100.0%	100.0%	97.3%	76.3%
Aug-2015	100.0%	99.3%	95.9%	75.3%
Sep-2015	99.7%	98.2%	94.4%	74.1%
Oct-2015	100.0%	97.3%	93.0%	73.1%
Nov-2015	100.0%	96.8%	91.8%	72.0%
Dec-2015	100.0%	96.9%	91.4%	71.5%

99.9th Percentile as %
95.0%
92.6%
91.2%
89.2%
87.5%
85.8%
84.6%
83.3%
81.9%
80.3%
78.8%
77.3%
75.8%
74.1%
73.3%
72.4%
71.7%
71.0%
71.3%
70.9%
69.4%
68.2%
66.8%
65.2%
64.9%
64.2%
63.9%
63.8%
62.8%
62.1%
62.1%
61.7%
60.8%
59.1%
57.7%
57.1%
56.4%
56.7%
57.7%

2013

59.4%	
58.3%	
58.3%	
57.9%	
57.5%	
56.4%	
55.0%	
54.0%	
52.7%	
52.7%	2014
52.0%	
52.3%	
53.1%	
52.2%	
52.0%	
51.8%	
52.0%	
50.7%	
49.2%	
48.0%	
47.8%	
46.9%	2015

Brisbane System drawdown curve - (

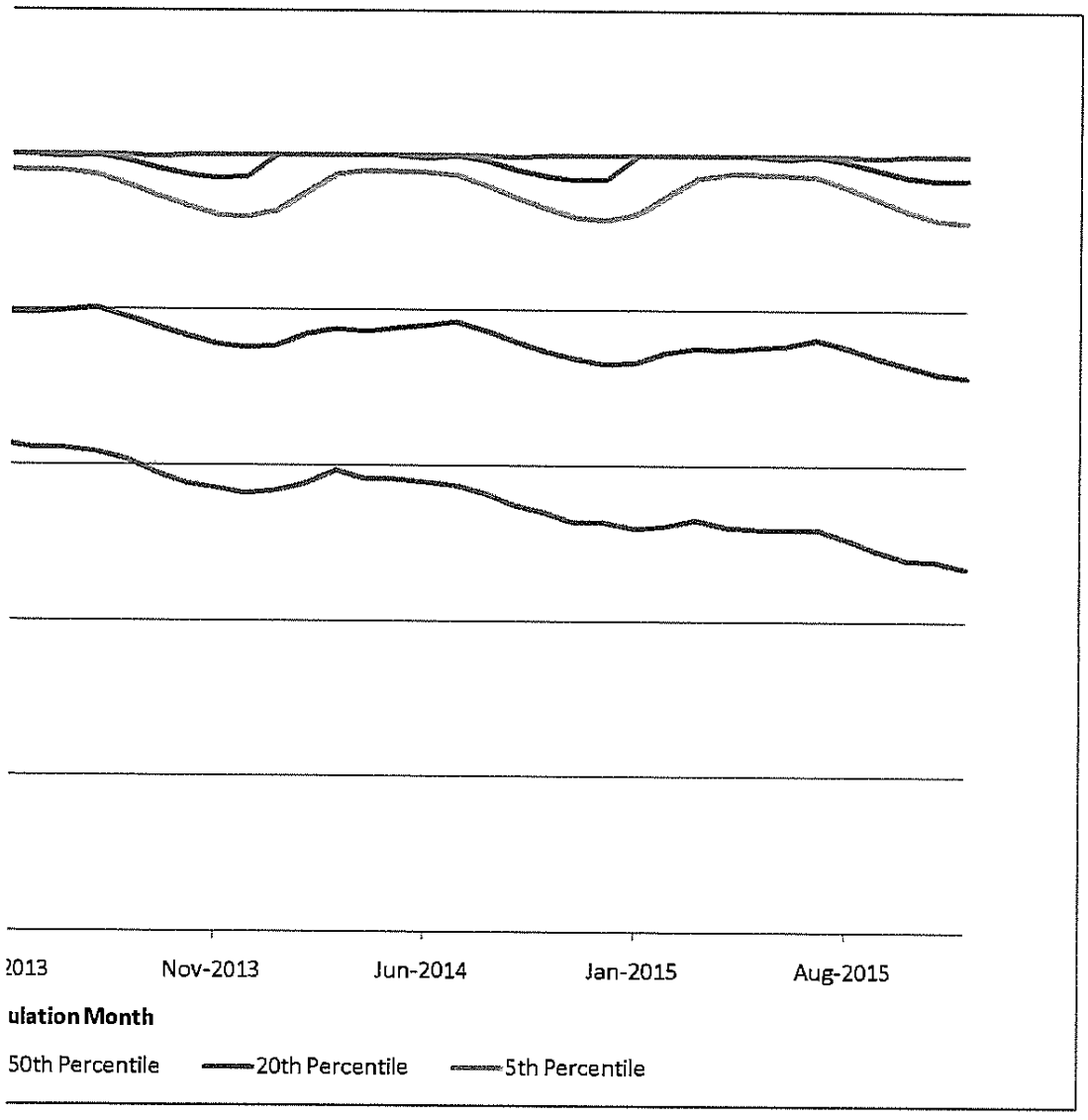


SEQ Regional Volume

Dam	**Volume**

LND	6671
Hinze	161073
LHD	24800
Somerset	379850
Wivenhoe	1165200
North Pine	215000
L Kurwongbah	15480
E Maddock	16700
Cooloolabin	14200
Wappa	4615
Baroon Pocket	61000
Lake MacDonald	8000
TOTAL	**2072589**

current levels



SEQ Water Grid manager

Memorandum

TRIM reference: D/10/7970	**Date:** 24 December 2010
To: Daniel Spiller, Director, Operations	
From [redacted] Water Engineer	
Subject: Water security modelling for Wivenhoe Dam flood releases	

Purpose

To seek in principle approval for water to be released from Wivenhoe and Somerset dams to 95 per cent (%) of storage capacity at any time until end March 2011.

Background

Minister Robertson wrote to our Chair on 25 October 2010 seeking advice regarding options to, and benefits of, releasing water from key SEQ Water Grid (Water Grid) storages in anticipation of major inflows over the coming summer (**Attachment 1**).

SEQ Water Grid Manager (WGM) officers have consulted with Seqwater regarding options and benefits of releasing water from key storages. Beyond the detailed advice outlined below, Seqwater officers have reiterated that Seqwater is confident of its ability to manage floods in accordance with the approved management plans and based on the existing Full Supply Level. While not necessary, Seqwater consider that in principle agreement to reduce storages to below Full Supply Level may provide operational advantages in some situations.

Relevant dams

In South East Queensland, Wivenhoe, Somerset, North Pine and Leslie Harrison dams are gated. Gates have also been installed as part of the Hinze Dam upgrade, which is scheduled to be completed by end January 2011. Other dams have a combination of small release valves and spillways and spill when above the Full Supply Level.

Gated dams provide an opportunity for water to be released to below the Full Supply Level in anticipation of future inflows.

Controlled releases impact upon downstream river levels, with the extent of impact dependent upon the amount releases. Controlled releases are only one of several factors that impact river levels, including tide and inflows downstream of the dam wall. For example, Wivenhoe and Somerset dams control only half of the Brisbane River catchment.

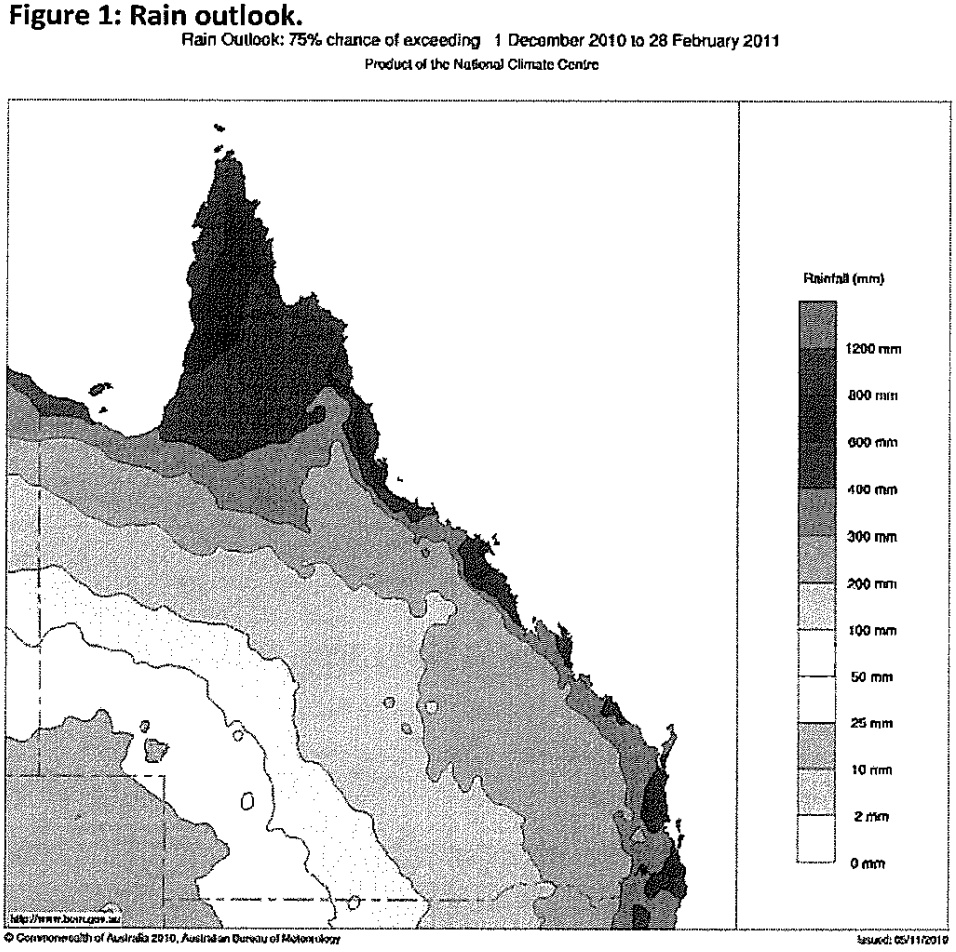
Probability of gate releases over the remainder of the wet season

Grid 12 storages are at 100% of combined capacity, with further rainfall forecast. The Bureau of Meteorology has advised that:

- heavy rainfall is likely across South East Queensland over the Christmas holiday period
- higher than average rainfall to continue over the remainder of the traditional wet season, with 75% probability of exceeding at least 300 millimetres of rainfall across South East Queensland from December 2010 to the end February 2011.

Any further rainfall is expected to result in significant inflows to storages, due to catchments being wet. With storages being full, these inflows will trigger managed releases from Wivenhoe, Somerset and North Pine dams.

Figure 1: Rain outlook.



Wivenhoe and Somerset dams: Medium to major flood events

Seqwater has advised that releases of greater than 3,500 cubic metres per second from Wivenhoe Dam are likely to impact on urban areas in Brisbane. Events of this nature have not been experienced since Wivenhoe Dam was completed in 1984.

Seqwater has advised that:

- Pre-emptive releases are likely to have negligible impacts on the extent of these impacts.
- Any impacts would require releases of at least 250,000 megalitres (ML). This is equivalent to a release of about 16% of the combined storage capacity of Wivenhoe and Somerset dams.

A pre-emptive release of this scale is not recommended, based on information currently available. The potential water security impacts are considered more significant than the negligible benefits. These potential security impacts include costs associated with the earlier or avoidable operation of the Gold Coast Desalination Plant (Desalination Plant) at capacity, as well as the increased probability of triggering the implementation of a drought response plan.

More detailed investigation of opportunities to manage flood storage is recommended, including options to increase flood supply level on a temporary basis. These investigations need to be led by Seqwater, and involve the Bureau of Meteorology, Councils and the Water Grid Manager.

Wivenhoe and Somerset dams: Minor flood events

Pre-emptive releases from Wivenhoe Dam may reduce the impacts of minor gate releases (strategies W1A to W1E in the operational procedures).

Minor gate releases may result in the closure of up to six bridges, isolating up to 50 dwellings and inconveniencing many more. As stated in existing flood management plans, releases should be managed to minimise the impacts on these residents. Over the immediate term, councils have requested that bridge closures be avoided over the Christmas to New Year period, if possible. In addition:

- There are resource implications involved in the activation of the flood control centre. Under flood management plans, the flood control centre must be staffed by suitability qualified officers at all times during gate releases. There are currently only four quality duty engineers who have staffed the flood centre for much of period since the initial release in October 2010.

- Gate releases during the Christmas holiday period would result in closure of dams to water based activities, impacting on up to 150,000 people who are expected to use the recreational facilities over the holiday period.

Recommendation

It is recommended that the WGM advise Seqwater that, from a water security perspective:

- in principle, we would not object to water being released from Wivenhoe and Somerset dams to 95% of storage capacity at any time until end March 2011
- any specific release should be endorsed by the Chief Executive Officer (CEO) or Director of Operations, prior to being made
- approval is for the existing wet season only and is subject to review prior to the 2011 wet season.

Under this recommendation, storage levels could potentially be reduced by up to about 77,250 ML. This is equivalent to the amount of water released between 13 and 16 December 2010, through a single gate.

Pre-emptive releases will be managed so as to minimise the likelihood of gate releases due to small storms and local rainfall. Storage capacity will usually be reduced through a combination of:

- Extended gate releases, especially for strategy W1C. For comparison, up to 130,000 ML per day was released during November 2010 and mid December 2010. At this rate, the additional releases could occur in approximately half a day.
- Ongoing gate releases of up to 30,000 ML per day, which would not isolate any residents but could inundate some lower bridges that cause inconvenience.
- Ongoing valve release of up to about 4,300 ML per day, which can be maintained without inundate any bridges.

Actual releases will be decided based on operational considerations.

The CEO and the Director of Operations will seek to ensure that storages are managed with the objective of being at Full Supply Level at the end of the wet season, in April 2011.

Water security impacts

The water security impacts of releases will be zero if the dams fill over the remainder of the wet season. Current forecasts indicate that there is a high probability of this occurring as:

- Heavy rainfall is forecast over the Christmas holiday period, as noted above.
- Over the remainder of the wet season, advice from the Bureau of Meteorology is that sea surface temperatures are likely to remain at levels typical of a La Niña event into the first quarter of 2011, with the majority of the models indicating the event will gradually weaken over the coming months.

The water security impacts will be minimal, even if there were no further inflows into the dams. Modelling indicates that the reduction would have a minimal impact on the probability of key Water Grid storages falling to 40% of capacity over the next five years.

Four cases were developed to assess the impact of the potential flood releases below Full Supply Level. Each was based on the model used to develop the October 2010 version of the Operating Strategy, with an update for the operation of the Desalination Plant. The outline of each case is shown below in **Table 1**.

The first two runs assess the difference in water security starting in January 2011 with storages at 100% and 95%. The second two cases assessed the scenario where dams were reduced to 95% and were not refilled this wet season, and therefore the simulation started in June 2011.

Table 1: Summary of models.

Case	Wivenhoe and Somerset dam level	Start month
1	100%	January 2011
2	95%	January 2011
3	100%	June 2011
4	95%	June 2011

Results show that the ability to meet the risk criteria stated in the South East Queensland System Operating Plan (SOP) (refer **Table 2**) is not affected by this change in supply level in January 2011. In addition, the difference in probability of Wivenhoe and Somerset dams refilling is negligible after six months. If releases are made to bring Wivenhoe and Somerset dams to 95% of combined storage, hydrologic modelling using stochastically generated inflows indicates that the point at which the probability of reaching 40% was brought forward by two months (refer **Figures 2 and 3**).

Table 2: SOP rules.

Trigger	1 year	3 years	5 years
T1	<0.2%	Not specified	<5%
T2	Not specified	<0.5%	<1%

Table 3: Current levels, starting January 2011 (case 1).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Table 4: Wivenhoe and Somerset dams at 95%, starting January 2011 (case 2).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Table 5: Current levels, starting June 2011 (case 3).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Table 6: Wivenhoe and Somerset dams at 95%, starting June 2011 (case 4).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Figure 2: Storage volume forecast Brisbane System (case 1).

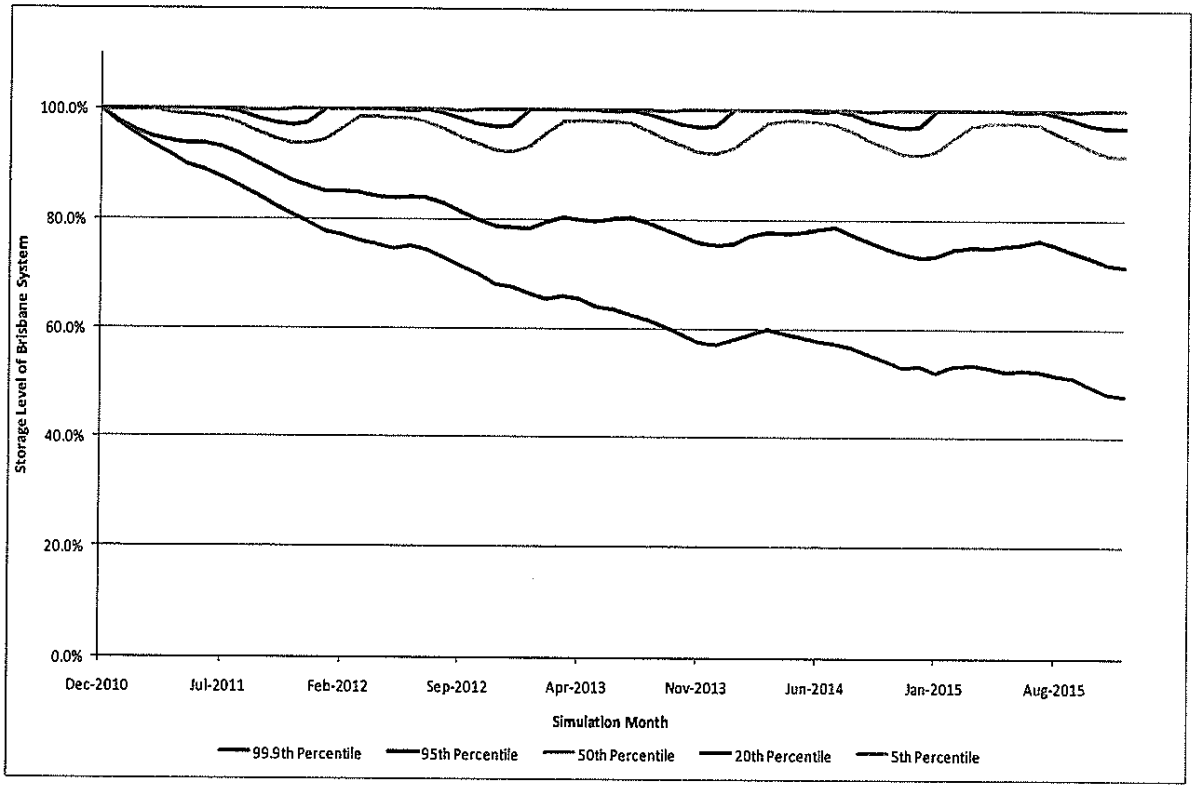


Figure 2: Storage volume forecast Brisbane System (case 2).

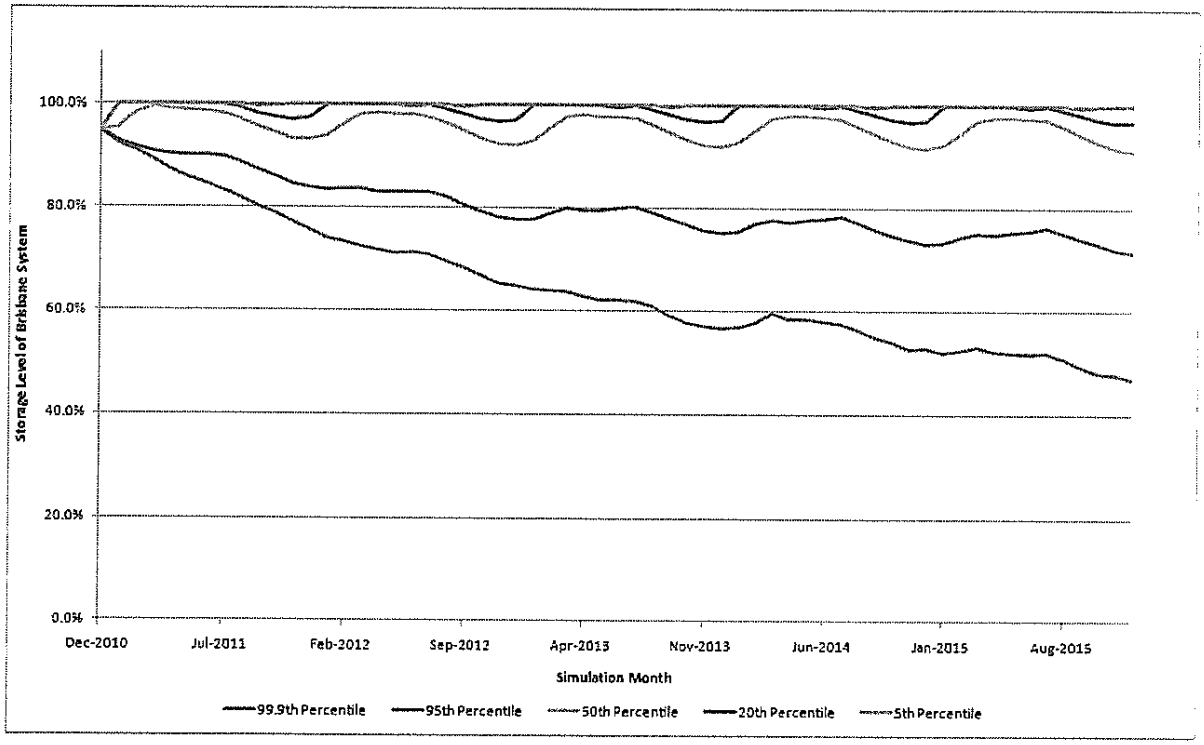


Figure 1 shows that, under the current case, 50% of long-term simulated inflow scenarios maintain the Brisbane System at full storage capacity over the next three months. With the release to 95% of Full Supply Level, 50% of simulated inflows return the dams to Full Supply Level in approximately four months.

As a worst case scenario, a scenario was run that reduced the Full Supply Level of Wivenhoe and Somerset dams to 95% of the current level for the full duration of the simulation (that is, a permanent reduction). This was undertaken to indicate the lower bound of results that could be expected when simulating the proposed dam release approach. Results for this scenario indicated that the probability of reaching 40% in the Brisbane System increased to 0.03% in five years, as compared to the base case of 0.01%.

North Pine and Leslie Harrison dams

North Pine and Leslie Harrison dams do not have flood mitigation potential. Once the dams have reached Full Supply Level, all water flows into the dam must be released to protect the structural safety of the dam.

Seqwater has advised that, without major releases, there are negligible benefits to reducing volumes stored in North Pine or Leslie Harrison dams for the purposes of reducing the extent or duration of any downstream flooding impacts.

For North Pine Dam, there may be some operational and community benefits to minor releases to below Full Supply Level in some circumstances. Any gate operation at North Pine Dam results in inundation of Youngs Crossing Road, which isolates a number of residents. These impacts are currently being minimised by releasing from North Pine Dam at night. With further rainfall forecast, Seqwater may choose to reduce the level to below Full Supply Level in order to reduce the frequency of night releases or the likelihood of releases being required during the day.

For this dam, it is recommended that the WGM advise Seqwater that, from a water security perspective:

- in principle, it would not object to water being released to 97.5% of storage capacity at any time until end March 2011
- any specific release should be endorsed by the CEO or Director of Operations prior to being made
- approval is for the existing wet season only, subject to review prior to the 2011 wet season.

For Leslie Harrison Dam, gate operations do not impact on public roads and generally only inconvenience the general public during large flood events. There is no scope to reduce this inconvenience through small pre-emptive releases. Accordingly, it is recommended that no in-principle approval be made for pre-emptive releases from this dam.

Summary of recommendations

It is recommended that the SEQ Water Grid Manager Board (Board) approve that:

- from a water security perspective, it would not object to water being released from Wivenhoe and Somerset dams to 95% of the Full Storage Level at any time until end March 2011
- from a water security perspective, it would not object to water being released from North Pine Dam to 97.5% of the Full Storage Level at any time until end March 2011
- any specific release should be endorsed by the CEO or Director of Operations prior to being made
- approval is for the existing wet season only, subject to review prior to the 2011 wet season.

The proposed letter from the Chair forms **Attachment 2**.

This advice is consistent with the verbal briefing provided to Minister Robertson at the 13 December 2010 Board meeting. The response to Minister Robertson will reflect this advice (refer **Attachment 3**).

From: [redacted]
Sent: Friday, December 24, 2010 11:17 AM
To: Barry Dennien <[redacted]>
Cc: Dan Spiller <[redacted]>; Waldman Karen [redacted]
Subject: RE: URGENT

Given that we will be guided by Seqwater's advice, as the experts for operating the dam, there advice would add weight to the argument.

Could you provide this?

Regards [redacted]

From: Barry Dennien [redacted]
Sent: Friday, 24 December 2010 11:04 AM
To: [redacted]
Cc: spiller daniel @ SEQWGM; Waldman Karen
Subject: RE: URGENT

[redacted]

Our advice reflects Seqwater's advice and our joint experiences over the past weeks of flood releases.

Barry

From: [redacted]
Sent: Friday, 24 December 2010 10:59 AM
To: Barry Dennien
Cc: [redacted] Waldman Karen
Subject: FW: URGENT

To help with our response could you please provide the information provided from Seqwater on the options and benefits of the proposed release as referred to in your letter.

Regards

[redacted]
Director, Planning Projects
[redacted]
www.qwc.qld.gov.au

Queensland Water Commission
53 Albert Street, Brisbane Q 4000
PO Box 15087, City East Q 4002

From: Barry Dennien [redacted]
Sent: Friday, 24 December 2010 10:17 AM
To [redacted]
Cc: Waldman Karen; spiller daniel @ SEQWGM
Subject: URGENT

[redacted]

See attached a letter we are planning to send to Seqwater giving our permission to lower Wivenhoe below full supply level down to 95% and North Pine to 97.5% for flood mitigation purposes. The is only for the current wet season.

We request the QWC note this proposed strategy and reply appropriately by midday today.

We apologise in advance for the short turnaround period. Current weather events have made us progress this issue.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

****
The information in this email together with any attachments is intended only for the person or entity to which it is addressed and may contain confidential and/or privileged material.

Any form of review, disclosure, modification, distribution and/or publication of this email message is prohibited, unless as a necessary part of Departmental business.

If you have received this message in error, you are asked to inform the sender as quickly as possible and delete this message and any copies of this message from your computer and/or your computer system network.
****

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: Barry Dennien
Sent: Friday, 24 December 2010 11:27 AM
To: [redacted]
Cc: Dan Spiller
Subject: Discussion Paper on Dam Full Supply Level Investigations Seqwater Gated Storages
Attachments: Discussion Paper on Dam Full Supply Level Investigations Seqwater Gated Storages.docx

Categories: T3

Doc's attached.

Regards
Barry

Attachment 1

Discussion Paper on Dam Full Supply Level Investigations Seqwater Gated Storages

Summary of comments

The attached paper summarises an analysis that changing the initial storage level of dams has on downstream flood impacts.

Wivenhoe/Somerset System

The analysis shows that for some minor floods similar to October 2010, reducing the starting volume of Wivenhoe Dam by 5% or 10% has minimal impacts on impacts downstream. The main benefit being that inundation times for downstream bridges will be reduced but only by around15%. However peak water levels are not affected. There are minimal potential benefits to downstream bridge until dam levels are reduced down to about 50% of capacity.

These results are not unexpected as Wivenhoe has such a large flood storage. Adding say 100,000ML to the flood storage (equates to reducing the storage volume by 10%) does not appreciably increase this available flood storage.

It should also be noted that in many cases, Wivenhoe flood releases will be made following the peaks of inflows into the Brisbane River from the Lockyer and Bremer Catchments. Certainly during many events, Lockyer Creek could already have inundated most or all of the road crossings downstream of Wivenhoe Dam. In these instances, a small amount of additional flood storage in the dam provides minimal benefit.

Another option considered was pre-releasing Wivenhoe water in anticipation of a flood event. This is not considered a viable option for the following reasons:

- Regardless of forecast, there is never any certainty on the amount of rain that will fall within a dam catchment. For example, on 29 November 2010, the quantitative forecast from BOM for the Wivenhoe Catchment was 25 to 50 millimetres. Actual rainfall received was in the order of 10 millimetres. On a saturated catchment this could equate to a runoff discrepancy of hundreds of thousands of megalitres. A pre-release of anticipated flood water based on forecast could result in major embarrassment.
- Any significant pre-release of water would result in bridge inundation below Wivenhoe Dam.
- Any pre-release of water from Wivenhoe Dam will take at least 24 hours to reach the lower end of the Brisbane River system. Rains occurring in the catchments below the dam over this period could potentially worsen downstream flood impacts.

The Bureau of Meteorology has been contacted and they have confirmed the above forecast reliability assessment. They advised that, whilst weather prediction models are steadily improving, the forecast of rainfall amounts over catchment time/space scales is recognised as one of the most challenging/difficult tasks. Detailed rainfall forecasting is not deterministic - the uncertainties involved are often expressed in probablistic forecasts and whilst there is often the ability to forecast the potential for a significant rain event to occur in the southeast

Qld-northern NSW region, it is difficult (if not impossible) to predict the actual location of the heaviest rain, even with only a few hours notice.

The Queensland Director of Dam Safety (Mr Peter Allen) was contacted and he confirmed the assessment that minor reductions in the stored volume of Wivenhoe Dam would have minimal impacts on floods downstream and concurred with the risks involved in any pre release of significant volumes of water from dams prior to an event.

North Pine and Leslie Harrison Dams

Lowering the normal FSL for North Pine and Leslie Harrison Dams will have minimal impact on major floods and may not decrease releases depending on the size of even minor events. However lowering the level of North Pine Dam after a flood release to between 95% and 100% may reduce the frequency of operations in some rain events although the main benefit is in operational efficiency as it provides more time for response and may reduce making releases in a minor storm event.

Similarly reducing Leslie Harrison level to around 95% after or before an event could assist in reducing call out of staff and manning the storage for minor releases and even the timing of releases.

Normally both dams are returned to just under 100% after an event based on base inflows still occurring and possible further rain. Allowing the dams to reduce to around 95% improves the operational leeway. However this could best be provided by an operational arrangement where the WGM simply agrees Seqwater has the operational latitude to reduce both storages to between 95% and 100% after an event or when there is some inflow and Seqwater can decide the exact level based on ongoing inflows and possible predicted rainfall, but not going below 95%.

DAM FULL SUPPLY LEVEL (FSL) INVESTIGATIONS
SEQWATER GATED STORAGES

INTRODUCTION

The following short paper examines the issues associated with temporary lowering the full supply levels of Seqwater's gated dams to improve short term flood mitigation benefits. The paper considers Wivenhoe Dam, Somerset Dam, North Pine Dam and Leslie Harrison Dam.

WIVENHOE DAM AND SOMERSET DAM

Wivenhoe Dam and Somerset dam control only 50% of the Brisbane River catchment (Bremer River and Lockyer Creek catchments are not controlled), therefore the Flood Mitigation benefits provided by the dam will depend on the rainfall distribution experienced during a flood event. This makes it difficult to quantify exactly the benefits of lowering the storage in anticipation of possible flood rains.

There are primarily two types of flood events that may occur in the Brisbane River Catchment. There are the smaller events that impact primarily on the rural bridges upstream of Moggill and the larger events that impact on urban areas in Brisbane. The threshold that separates these two events is a river flow of around 3500 cubic metres per second at Moggill. To understand the possible benefits of lowering the storage to reduce flooding impacts, it makes sense to discuss these two types of events separately.

Events Impacting on Bridges (Moggill Flow < 3500m^3/s) – Limited Urban Impacts

In recent history, flood events of this nature occurred in April 1989, February 1999 and October 2010. The flow characteristics of events of this type are shown in the following table.

Event	Wivenhoe Dam					
	Starting Level		Volume Of Inflow	Volume Of Outflow	Peak Outflow	Peak Water Level
	m AHD	%	ML	ML	m3/s	m AHD
Early April 1989	67.06	>100	690,000	690,000	1,620	69.78
Late April 1989	67.00	100	870,000	820,000	1,490	71.45
February 1999	63.92	<100	1,220,000	900,600	1,800	70.45
October 2010	67.03	>100	640,000	640,000	1,300	69.65

The October 2010 event was examined to determine the benefits of lowering the storage level. This event commenced with the dam at FSL. The event was examined with the dam at 95% capacity, 90% capacity, 80% capacity, 50% capacity and empty at the commencement of the event. The results are shown in the following table. When reading the table it is important to understand that the bridges are impacted not just by outflows from Wivenhoe, but also by flows from the uncontrolled areas of the river catchment. Accordingly, the location of a bridge within the system will dictate the size of catchment area that will impact on the bridge. All inundation times shown in the table are approximations only, made for the purposes of this investigation.

Dam Percentage Full at Event Commencement	Approximate Duration of Wivenhoe Radial Gate Releases/ Twin Bridges Inundation (hours)	Approximate Duration of Savages Crossing and Colleges Crossing Inundation (hours)	Approximate Duration of Burtons Bridge and Kholo Bridge Inundation (hours)	Peak Flow at Moggill (m^3/s)
100%	230	247	183	1848
95%	187	214	183	1848
90%	185	214	183	1841
80%	172	214	183	1786
50%	130	214	153	1722
0%	0	189	38	940

The table shows that the reduction in FSL won't have a large impact on Bridge inundation times. A reduction in the order or 36 hours or 15% of the total inundation time may be possible for the low level bridges only. The reductions are generally caused by the delay in release commencement associated with the lower starting FSL. However, the bridges can often already inundated at this time anyway due to flood inflows into the Brisbane River from the 50% of the catchment not controlled by Wivenhoe Dam. Lowering the FSL of the dam has no impact on such inundations as shown in the table.

For events smaller than those considered above, it should be noted that the Manual of Flood Mitigation allows a trigger level buffer of 27500 megalitres above FSL and this has the effect of protecting Twin Bridges and the lower level bridges from inundation as a result of minor events. Twin Bridges is essentially a low level causeway that is inundated following any radial gate release. This inundation could possibly be prevented by raising the bridge deck level. Regardless, the areas accessed using this bridge can also be accessed using the Fernvale Bridge. It is acknowledged however that the closing of Twin Bridges causes inconvenience to local residents, as it adds approximately another five kilometres to the journeys to and from their residences. Approximately 40 residences and several businesses (primarily turf farms) are impacted.

Events Impacting on Urban Areas (Moggill Flow > 3500m^3/s) – All rural bridges inundated

Events of this nature have not been experienced since the construction of Wivenhoe Dam was completed in 1984, with the last event of this nature being experienced in 1974. The inflow volume into Wivenhoe Dam associated with the 1974 event has been estimated to be in the order of 1.5 million megalitres. However during the 1974 event, an additional 1.5 million megalitres of flood flow impacting of the urban areas of Brisbane originated from catchment areas that are not controlled by Wivenhoe Dam.

For events of this nature, it is unlikely that peak water levels in Brisbane would be significantly impacted by minor reductions in the level of Wivenhoe Dam. Certainly reductions in dam volume in the order of at least 250000 megalitres would be needed to provide any significant reduction in water level peaks experienced in urban areas. Additionally, reductions in the FSL of this order would not necessarily guarantee reductions in urban flood levels, as the effectiveness of Wivenhoe Dam in reducing urban flood levels is

directly dependant on the distribution of rainfall in the Brisbane River catchment during a flood event (Wivenhoe Dam controls only 50% of the total Brisbane River catchment) and the spacing between individual flood events.

NORTH PINE DAM

North Pine Dam has no flood mitigation potential. Unlike Wivenhoe Dam, once the dam has reached FSL, all water flows into the dam must be released to protect the structural safety of the dam.

Any radial gate operation at North Pine Dam to release flood water, results in inundation of Youngs Crossing Road, so lowering the FSL is problematic and may best be achieved by increasing the daily water diversion to the North Pine Dam Water Treatment Plant. There are river release valves that allow some water to be drained from North Pine Dam without inundating Youngs Crossing. These valves have been operated continuously since the recent gate releases to manage residual inflows into the dam. However outflows from these valves are restricted to flows in the order of several hundred megalitres per day as larger flows will adversely impact on Youngs Crossing. Certainly a small reduction in the level of North Pine Dam is potentially beneficial in preventing closures of Youngs Crossing Road associated with small storm events.

It should be noted however that Youngs Crossing Road is also impacted by uncontrolled flood flows from Lake Kurwongbah and local storm run-off. In recent times Youngs Crossing Road has been closed by flood water during times when no water releases were being made from North Pine Dam, but when storm rains resulted in flood flows from uncontrolled areas of the catchment.

The table below gives an indication of the rainfall required to operate for NPD:

Level	Capacity			Rainfall Required to Operate	
				Wet Conditions	Dry Conditions
	m AHD	%	ML	mm	mm
FSL	39.60	100.0%	214,302	5	60
Reduced FSL	39.10	95.0%	203,618	35	100

Recent changes to the Manual of Flood Mitigation for North Pine Dam allows for some ability to retain up to 2500 megalitres of water to reduce impacts on Youngs Crossing Road, provided favourable weather forecasts are experienced. However the preferred option to reduce public inconvenience associated with storm events would be to raise the flood immunity of the river crossing on Youngs Crossing Road. This crossing is primarily a low level causeway that is potentially unsuitable given the volume of traffic that now uses this crossing on a daily basis.

LESLIE HARRISON DAM

Similar to North Pine Dam, Leslie Harrison Dam has no flood mitigation potential. Once the dam has reached FSL, all water flows into the dam must be released to protect the structural safety of the dam.

The dam is relatively small with a total full supply storage volume of only 24800 megalitres, against an inflow volume during a 72 hour 1 in 50 year storm event of over 30000 megalitres. Flood gate operations at Leslie Harrison Dam do not impact on public roads and generally only inconvenience the general public during large flood events. Reductions in this inconvenience cannot be achieved by small reductions in dam storage

[redacted]

From: Barry Dennien
Sent: Friday, 24 December 2010 11:58 AM
To: Dan Spiller
Subject: FW: URGENT

Importance: High

Categories: T3

From: Waldman Karen [redacted]
Sent: Friday, 24 December 2010 11:56 AM
To: Barry Dennien
Cc: [redacted]
Subject: FW: URGENT
Importance: High

Hi Barry

The QWC has considered the request by the SEQ Water Grid Manager to comment on the proposed drawdown of:

- Wivenhoe and Somerset dams to 95% of their combined full supply level
- North Pine Dam being drawn down to 97.5% of it's full supply level

The Commission note that the Water Grid Manager has no concerns and advises that the drawdown will not infringe the risk criteria stipulated in the SEQ System Operating Plan or the interim operating strategy. The Water Grid Manager has also stated that this drawdown will not impact on their ability to meet supply obligations to the Water Grid customers. Based on this advice, the Commission has no objection to the proposed release.

It is noted also that such releases are an operational matter for Seqwater, within the context of the Resource Operations Plan, where there is no condition in the SEQ System Operating Plan that regulates releases from the dams concerned.

It is however recommended that Seqwater liaise with the Department of Environment and Resource Management to confirm their understanding of any conditions that apply, particularly in relation to dam safety matters.

Regards, Karen

==========

From: Barry Dennien [redacted]
Sent: Friday, 24 December 2010 10:17 AM
To: [redacted]
Cc: Waldman Karen; spiller daniel @ SEQWGM
Subject: URGENT

[redacted]

See attached a letter we are planning to send to Seqwater giving our permission to lower Wivenhoe below full supply level down to 95% and North Pine to 97.5% for flood mitigation purposes. The is only for the current wet season.

We request the QWC note this proposed strategy and reply appropriately by midday today.

We apologise in advance for the short turnaround period. Current weather events have made us progress this issue.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

****
The information in this email together with any attachments is intended only for the person or entity to which it is addressed and may contain confidential and/or privileged material.

Any form of review, disclosure, modification, distribution and/or publication of this email message is prohibited, unless as a necessary part of Departmental business.

If you have received this message in error, you are asked to inform the sender as quickly as possible and delete this message and any copies of this message from your computer and/or your computer system network.
****

Litsupport Brisbane

From: Barry Dennien
Sent: Friday, 24 December 2010 1:36 PM
To: Barry Dennien; [redacted]
Cc: Dan Spiller
Subject: Wivenhoe Dam levels
Attachments: Internal memo for Wivenhoe and Somerset December 2010 flood releases.docx; Letter to Minister - flood management.docx; Seqwater letter re Min s request on options for release of water.docx

Dear Board members

See attached three documents with regards lowering the levels of Wivenhoe and North Pine Dams below full supply level over this coming wet season to assist in flood mitigation.

Due to timelines required for approvals Gary has approved this request out of session and has asked that I forward the documents on.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
[redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

SEQ Water Grid manager

Memorandum

TRIM reference: D/10/7970	**Date:** 5 May 2011
To: [redacted]	
From: Barry Dennien	
Subject: Water security modelling for Wivenhoe Dam flood releases	

Purpose

To seek in principle approval for water to be released from Wivenhoe and Somerset dams to 95 per cent (%) of storage capacity at any time until end March 2011.

Background

Minister Robertson wrote to our Chair on 25 October 2010 seeking advice regarding options to, and benefits of, releasing water from key SEQ Water Grid (Water Grid) storages in anticipation of major inflows over the coming summer (**Attachment 1**).

SEQ Water Grid Manager (WGM) officers have consulted with Seqwater regarding options and benefits of releasing water from key storages. Beyond the detailed advice outlined below, Seqwater officers have reiterated that Seqwater is confident of its ability to manage floods in accordance with the approved management plans and based on the existing Full Supply Level. While not necessary, Seqwater consider that in principle agreement to reduce storages to below Full Supply Level may provide operational advantages in some situations.

Relevant dams

In South East Queensland, Wivenhoe, Somerset, North Pine and Leslie Harrison dams are gated. Gates have also been installed as part of the Hinze Dam upgrade, which is scheduled to be completed by end January 2011. Other dams have a combination of small release valves and spillways and spill when above the Full Supply Level.

Gated dams provide an opportunity for water to be released to below the Full Supply Level in anticipation of future inflows.

Controlled releases impact upon downstream river levels, with the extent of impact dependent upon the amount releases. Controlled releases are only one of several factors that impact river levels, including tide and inflows downstream of the dam wall. For example, Wivenhoe and Somerset dams control only half of the Brisbane River catchment.

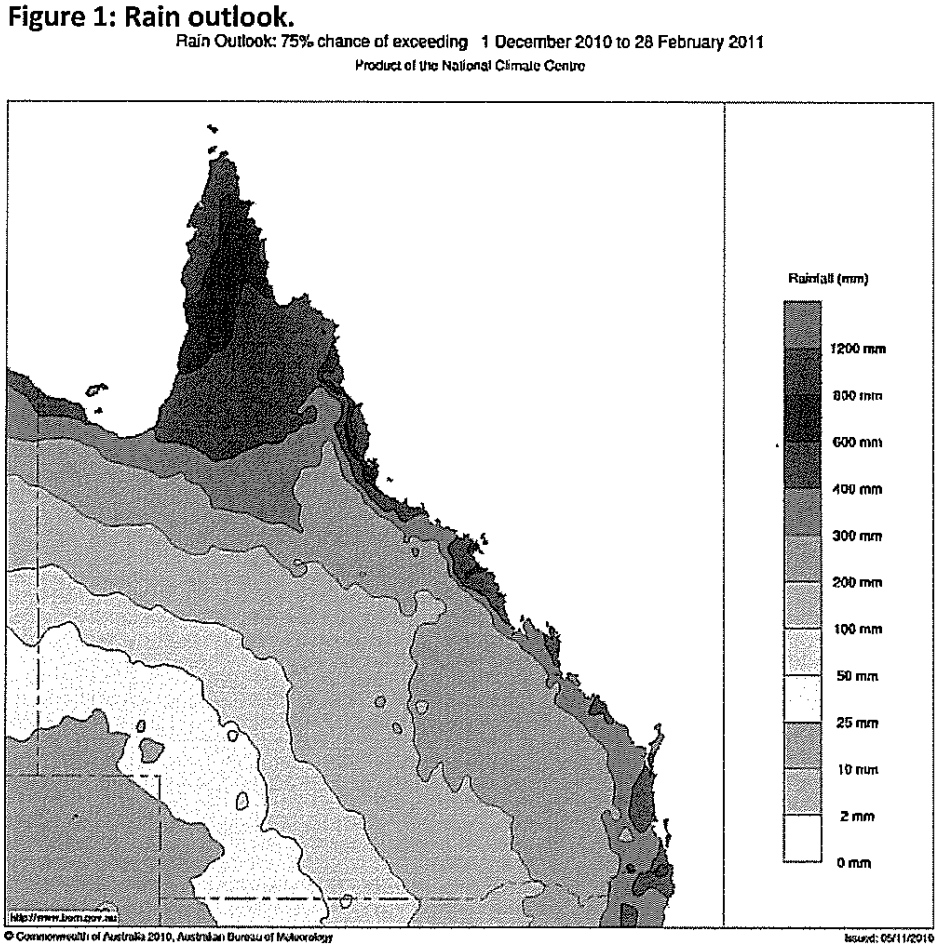
Probability of gate releases over the remainder of the wet season

Grid 12 storages are at 100% of combined capacity, with further rainfall forecast. The Bureau of Meteorology has advised that:

- heavy rainfall is likely across South East Queensland over the Christmas holiday period
- higher than average rainfall to continue over the remainder of the traditional wet season, with 75% probability of exceeding at least 300 millimetres of rainfall across South East Queensland from December 2010 to the end February 2011.

Any further rainfall is expected to result in significant inflows to storages, due to catchments being wet. With storages being full, these inflows will trigger managed releases from Wivenhoe, Somerset and North Pine dams.

Figure 1: Rain outlook.



Wivenhoe and Somerset dams: Medium to major flood events

Seqwater has advised that releases of greater than 3,500 cubic metres per second from Wivenhoe Dam are likely to impact on urban areas in Brisbane. Events of this nature have not been experienced since Wivenhoe Dam was completed in 1984.

Seqwater has advised that:

- Pre-emptive releases are likely to have negligible impacts on the extent of these impacts.
- Any impacts would require releases of at least 250,000 megalitres (ML). This is equivalent to a release of about 16% of the combined storage capacity of Wivenhoe and Somerset dams.

A pre-emptive release of this scale is not recommended, based on information currently available. The potential water security impacts are considered more significant than the negligible benefits. These potential security impacts include costs associated with the earlier or avoidable operation of the Gold Coast Desalination Plant (Desalination Plant) at capacity, as well as the increased probability of triggering the implementation of a drought response plan.

More detailed investigation of opportunities to manage flood storage is recommended, including options to increase flood supply level on a temporary basis. These investigations need to be led by Seqwater, and involve the Bureau of Meteorology, Councils and the Water Grid Manager.

Wivenhoe and Somerset dams: Minor flood events

Pre-emptive releases from Wivenhoe Dam may reduce the impacts of minor gate releases (strategies W1A to W1E in the operational procedures).

Minor gate releases may result in the closure of up to six bridges, isolating up to 50 dwellings and inconveniencing many more. As stated in existing flood management plans, releases should be managed to minimise the impacts on these residents. Over the immediate term, councils have requested that bridge closures be avoided over the Christmas to New Year period, if possible. In addition:

- There are resource implications involved in the activation of the flood control centre. Under flood management plans, the flood control centre must be staffed by suitability qualified officers at all times during gate releases. There are currently only four quality duty engineers who have staffed the flood centre for much of period since the initial release in October 2010.

- Gate releases during the Christmas holiday period would result in closure of dams to water based activities, impacting on up to 150,000 people who are expected to use the recreational facilities over the holiday period.

Recommendation

It is recommended that the WGM advise Seqwater that, from a water security perspective:

- in principle, we would not object to water being released from Wivenhoe and Somerset dams to 95% of storage capacity at any time until end March 2011
- any specific release should be endorsed by the Chief Executive Officer (CEO) or Director of Operations, prior to being made
- approval is for the existing wet season only and is subject to review prior to the 2011 wet season.

Under this recommendation, storage levels could potentially be reduced by up to about 77,250 ML. This is equivalent to the amount of water released between 13 and 16 December 2010, through a single gate.

Pre-emptive releases will be managed so as to minimise the likelihood of gate releases due to small storms and local rainfall. Storage capacity will usually be reduced through a combination of:

- Extended gate releases, especially for strategy W1C. For comparison, up to 130,000 ML per day was released during November 2010 and mid December 2010. At this rate, the additional releases could occur in approximately half a day.
- Ongoing gate releases of up to 30,000 ML per day, which would not isolate any residents but could inundate some lower bridges that cause inconvenience.
- Ongoing valve release of up to about 4,300 ML per day, which can be maintained without inundate any bridges.

Actual releases will be decided based on operational considerations.

The CEO and the Director of Operations will seek to ensure that storages are managed with the objective of being at Full Supply Level at the end of the wet season, in April 2011.

Water security impacts

The water security impacts of releases will be zero if the dams fill over the remainder of the wet season. Current forecasts indicate that there is a high probability of this occurring as:

- Heavy rainfall is forecast over the Christmas holiday period, as noted above.
- Over the remainder of the wet season, advice from the Bureau of Meteorology is that sea surface temperatures are likely to remain at levels typical of a La Niña event into the first quarter of 2011, with the majority of the models indicating the event will gradually weaken over the coming months.

The water security impacts will be minimal, even if there were no further inflows into the dams. Modelling indicates that the reduction would have a minimal impact on the probability of key Water Grid storages falling to 40% of capacity over the next five years.

Four cases were developed to assess the impact of the potential flood releases below Full Supply Level. Each was based on the model used to develop the October 2010 version of the Operating Strategy, with an update for the operation of the Desalination Plant. The outline of each case is shown below in **Table 1**.

The first two runs assess the difference in water security starting in January 2011 with storages at 100% and 95%. The second two cases assessed the scenario where dams were reduced to 95% and were not refilled this wet season, and therefore the simulation started in June 2011.

Table 1: Summary of models.

Case	Wivenhoe and Somerset dam level	Start month
1	100%	January 2011
2	95%	January 2011
3	100%	June 2011
4	95%	June 2011

Results show that the ability to meet the risk criteria stated in the South East Queensland System Operating Plan (SOP) (refer **Table 2**) is not affected by this change in supply level in January 2011. In addition, the difference in probability of Wivenhoe and Somerset dams refilling is negligible after six months. If releases are made to bring Wivenhoe and Somerset dams to 95% of combined storage, hydrologic modelling using stochastically generated inflows indicates that the point at which the probability of reaching 40% was brought forward by two months (refer **Figures 2 and 3**).

Table 2: SOP rules.

Trigger	1 year	3 years	5 years
T1	<0.2%	Not specified	<5%
T2	Not specified	<0.5%	<1%

Table 3: Current levels, starting January 2011 (case 1).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Table 4: Wivenhoe and Somerset dams at 95%, starting January 2011 (case 2).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Table 5: Current levels, starting June 2011 (case 3).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Table 6: Wivenhoe and Somerset dams at 95%, starting June 2011 (case 4).

Trigger	1 year	3 years	5 years
T1	0	0	0.01%
T2	0	0	0
Brisbane System reaching 40%	0.00%	0.00%	0.01%

Figure 2: Storage volume forecast Brisbane System (case 1).

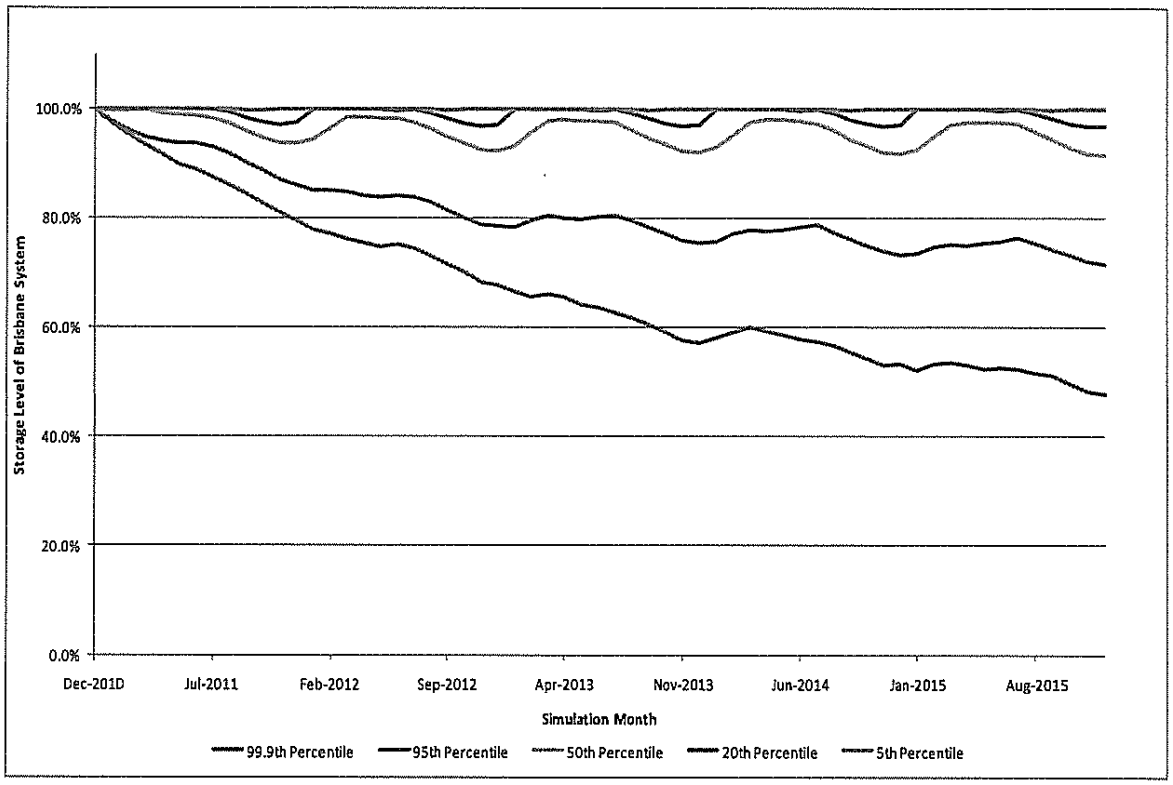


Figure 2: Storage volume forecast Brisbane System (case 2).

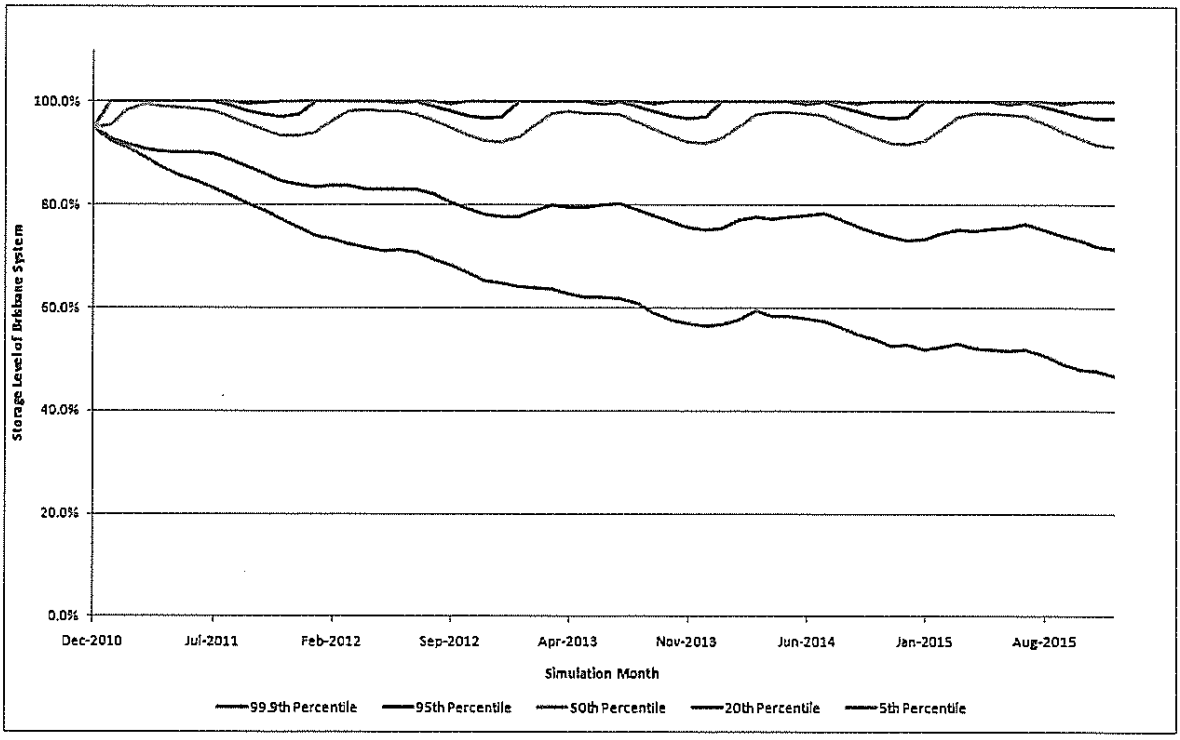


Figure 1 shows that, under the current case, 50% of long-term simulated inflow scenarios maintain the Brisbane System at full storage capacity over the next three months. With the release to 95% of Full Supply Level, 50% of simulated inflows return the dams to Full Supply Level in approximately four months.

As a worst case scenario, a scenario was run that reduced the Full Supply Level of Wivenhoe and Somerset dams to 95% of the current level for the full duration of the simulation (that is, a permanent reduction). This was undertaken to indicate the lower bound of results that could be expected when simulating the proposed dam release approach. Results for this scenario indicated that the probability of reaching 40% in the Brisbane System increased to 0.03% in five years, as compared to the base case of 0.01%.

North Pine and Leslie Harrison dams

North Pine and Leslie Harrison dams do not have flood mitigation potential. Once the dams have reached Full Supply Level, all water flows into the dam must be released to protect the structural safety of the dam.

Seqwater has advised that, without major releases, there are negligible benefits to reducing volumes stored in North Pine or Leslie Harrison dams for the purposes of reducing the extent or duration of any downstream flooding impacts.

For North Pine Dam, there may be some operational and community benefits to minor releases to below Full Supply Level in some circumstances. Any gate operation at North Pine Dam results in inundation of Youngs Crossing Road, which isolates a number of residents. These impacts are currently being minimised by releasing from North Pine Dam at night. With further rainfall forecast, Seqwater may choose to reduce the level to below Full Supply Level in order to reduce the frequency of night releases or the likelihood of releases being required during the day.

For this dam, it is recommended that the WGM advise Seqwater that, from a water security perspective:

- in principle, it would not object to water being released to 97.5% of storage capacity at any time until end March 2011
- any specific release should be endorsed by the CEO or Director of Operations prior to being made
- approval is for the existing wet season only, subject to review prior to the 2011 wet season.

For Leslie Harrison Dam, gate operations do not impact on public roads and generally only inconvenience the general public during large flood events. There is no scope to reduce this inconvenience through small pre-emptive releases. Accordingly, it is recommended that no in-principle approval be made for pre-emptive releases from this dam.

Summary of recommendations

It is recommended that the SEQ Water Grid Manager Board (Board) approve that:

- from a water security perspective, it would not object to water being released from Wivenhoe and Somerset dams to 95% of the Full Storage Level at any time until end March 2011
- from a water security perspective, it would not object to water being released from North Pine Dam to 97.5% of the Full Storage Level at any time until end March 2011
- any specific release should be endorsed by the CEO or Director of Operations prior to being made
- approval is for the existing wet season only, subject to review prior to the 2011 wet season.

The proposed letter from the Chair forms **Attachment 2**.

This advice is consistent with the verbal briefing provided to Minister Robertson at the 13 December 2010 Board meeting. The response to Minister Robertson will reflect this advice (refer **Attachment 3**).

TRIM ref: D/10/7953

24 December 2010

Hon Stephen Robertson MP
Minister for Natural Resources, Mines and Energy
and Minister for Trade
PO Box 15216
Brisbane Qld 4001

Dear Minister

I am pleased to respond to your letter of 25 October 2010 regarding options to and benefits of releasing water from key storages in anticipation of major inflows over the current wet season. Our advice follows, based on discussions with Seqwater.

Only four of the dams in South East Queensland region are gated, with the ability to release significant amounts of water in anticipation of major inflows. These are Wivenhoe, Somerset, North Pine and Leslie Harrison dams.

Detailed operational procedures have been approved for each of the gated dams. The dams will continue to be operated in accordance with these procedures. These procedures generally relate to the management of the dams and should be managed above Full Supply Level. This advice relates to the water security aspect of the management of the dams below Full Supply Level.

Based on information currently available, Seqwater has advised that releasing water to below Full Supply Level may provide some benefits in terms of reduced community and operational impacts during minor inflow events, such as has occurred over the past month. For medium and major flood events, it considers that pre-emptive releases will provide negligible benefits.

Informed by this advice, the SEQ Water Grid Manager has advised Seqwater that, from a water security perspective, it has no in-principle objection to minor releases from Wivenhoe, Somerset and North Pine dams to minimise the operational and community impacts of gate releases. Specifically, it has advised that it has no in-principle objection to:

- Wivenhoe and Somerset dams being drawn down to 95 per cent of their combined Full Supply Level
- North Pine Dam being drawn down to 97.5 per cent of its Full Supply Level.

The SEQ Water Grid Manager has assessed the water security implications of the release to be negligible, having no impact on our ability to meet the risk criteria specified in the System Operating Plan or our ability to meet our supply obligations to Grid Customers. From a water security perspective, the Queensland Water Commission has also confirmed that it does not have any objections to the potential release.

Please note that these arranges are intended to apply for the current wet season only, taking into account the level of storages and the rainfall forecasts over coming months.

For future wet seasons, the SEQ Water Grid Manager will continue to work with Seqwater to investigate the optimal arrangements. In particular, we propose to further investigate options that may reduce the frequency or duration of intermediate level flows (between 1,900 and 3,500 cubic metres per second). In addition, we recommend that the investigations with the Queensland Water Commission to examine the opportunity of raising the full supply level of Wivenhoe Dam for water supply be expanded to include options involving the release of the additional water once major inflows are forecast.

I trust that this advice is sufficient. If you have any questions, please do not hesitate to contact Mr Dan Spiller, Director Operations, by telephone or [redacted] or by email on [redacted]

Yours sincerely

[redacted]

Chair

ATTACHMENT

Wivenhoe and Somerset dams

Wivenhoe Dam can store up to 1.15 million litres (ML) of drinking water. In addition, it has the capacity to store an additional 1.45 ML of flood water.

While large, the flood compartment can be filled within days. For example, following heavy rainfall in October 2010 Wivenhoe Dam received inflows equivalent to almost half of the flood storage compartment capacity in just a few days.

Several factors influence flood release strategies for Wivenhoe and Somerset dams.

First, rain events that have caused flooding have historically been prolonged events over several days, often with a second event occurring several days to a week after the first. As a result, the operational procedures for the dam are designed to ensure that all water held in the flood compartments is released within seven days of a rain event, ensuring that the flood compartment is available for any future inflows.

Secondly, the dam only controls flood waters from part of the Brisbane River catchment area. About 50 per cent of the catchment area of the Brisbane River is upstream of the Wivenhoe Dam wall, and can be potentially controlled by it. No flood mitigation structures exist for most of the potential run-off from the other 50 per cent of the catchment area.

Third, the Bureau of Meteorology has had limited success in plotting rainfall distribution accurately to assess where most flooding risk lies above or below the dam wall. Historical floods have demonstrated that flooding can occur from both. For example, the 1974 flood flows primarily occurred below the dam wall whilst the 1890's event occurred above the dam wall. As a result, when releasing water from Wivenhoe Dam it is very important to predict and monitor below the dam wall flows so as to understand combined river flows that cause flood impacts.

Taking these factors into account, the flood release strategy for Wivenhoe and Somerset dams has a hierarchy of objectives:

- Ensure the structural safety of the dam
- Provide optimum protection of urbanised areas from inundation
- Minimise disruption to rural life
- Retain full supply level after a flood event
- Minimise impacts to flora and fauna during the drain down phase.

Within this framework, flood releases from Wivenhoe Dam typically fall into two categories of flood events based on the impact they cause when combined with below the dam wall catchment runoff:

- Larger events typically involving combined river flows greater than 3,500 cubic meters per second measured at Moggill. These events would have flood impacts on urban areas in Brisbane. This scale of release has not been required since Wivenhoe Dam was completed.

- Smaller events with combined river flows of less than 1,900 cubic meters per second measured at the Mt Crosby weir which can inundate up to seven rural bridges isolating up to 50 households and causing inconvenience to many more. There has been six of these events since 1984, when Wivenhoe Dam was completed.

Our assessment of the benefits of lowering dam storage levels to reduce flooding impacts is below for these two event types.

Large events

Seqwater has advised that releases of greater than 3,500 cubic metres per second (m3/s) from Wivenhoe Dam are likely to impact on urban areas in Brisbane. Events of this nature have not been experienced since Wivenhoe Dam was completed in 1984.

Seqwater has advised that:

- pre-emptive releases are likely to have negligible impacts on the extent of these impacts
- any impacts would require releases of at least 250,000 ML. This is equivalent to a release of about 16 per cent of the combined storage capacity of Wivenhoe and Somerset dams.

A pre-emptive release of this scale is not recommended, based on information currently available. The potential water security impacts are considered to be more significant than the negligible benefits. These potential security impacts include costs associated with the earlier or avoidable operation of the desalination facility at capacity, as well as the increased probability of triggering the implementation of a drought response plan.

More detailed investigation of opportunities to actively manage flood storage is recommended, including options to increase flood supply level on a temporary basis. These investigations need to be led by Seqwater, and involve the Bureau of Meterology, Councils and the SEQ Water Grid Manager.

In particular, t has been identified that it is worth investigating the impacts on downstream flooding for intermediate level flows (flows between 1900 and 3500 cm^3/s).

Seqwater will undertake extensive investigations for the Queensland Water Commission in early 2011 to examine the opportunity of raising the full supply level of Wivenhoe Dam for water supply. We will recommended that the scope of this work be widened to consider the benefits of pre-lowering storage levels based on mid range rainfall events and the reduced impacts to river levels and subsequent property impacts. It is noted that predicting rainfall intensity and location, even as events are about to occur has not been accurate, however the Bureau of Meteorology is improving its methods.

Smaller events

Pre-emptive releases from Wivenhoe Dam may reduce the impacts of minor gate releases (strategies W1A to W1E in the operational procedures).

Minor gate releases may result in the closure of up to six bridges, isolating up to 50 dwellings and inconveniencing many more. As stated in existing flood management plans, releases should be managed to minimise the impacts on these residents. Over the immediate term, Councils have requested that bridge closures be avoided over the Christmas to New Year period, if at all possible. In addition:

- There are resource implications involved in the activation of the flood control centre. Under flood management plans, the centre must be staffed by suitability qualified officers at all times during gate releases. There are currently only four quality duty engineers, who have staffed the flood centre for much of period since the initial release in October.
- Gate releases during the Christmas holiday period would result in closure of dams to water based activities, impacting on up to 150,000 people who are expected to use the recreational facilities over the holiday period.

The Water Grid Manager has advised Seqwater that, from a water security perspective, it would not object to water being released from Wivenhoe and Somerset dams to 95 per cent of storage capacity at any time until end March 2010.

Under this recommendation, storage levels could potentially be reduced by up to about 77,250 ML. This is equivalent to the amount of water released between 13 and 16 December 2010, through a single gate.

Pre-emptive releases will be managed so as to minimise the likelihood of gate releases due to small storms and local rainfall. Storage capacity will usually be reduced through a combination of:

- Extended gate releases, especially for strategy W1C. For comparison, up to 130,000 ML/day was released during in November and mid December 2010. At this rate, the additional releases could occur in about half a day.
- Ongoing gate releases of up to 30,000 ML/day, which do not isolate any residents but can inundate some lower bridges that cause inconvenience.
- Ongoing valve release of up to about 4,300 ML/day, which can be maintained without inundate any bridges.

Actual releases would be decided by Seqwater based on operational considerations and in accordance with its statutory and regulatory obligations.

Water security impacts

The water security impacts of releases will be zero if the dams fill over the remainder of the wet season. Current forecasts indicate that there is a high probability of this occurring:

- Heavy rainfall is forecast over the Christmas holiday period, as noted above.
- Over the remainder of the wet season, advice from the Bureau of Meteorology is that sea surface temperatures are likely to remain at levels typical of a La Niña event into the first quarter of 2011, with the majority of the models indicating the event will gradually weaken over the coming months.

The water security impacts will be minimal, even if there were no further inflows to the dams. Modelling indicates that the reduction would have a minimal impact on the probability of key water Grid storages falling to 40 per cent of capacity over the next five years.

North Pine and Leslie Harrison dams

North Pine and Leslie Harrison dams do not have flood mitigation potential. Once the dams have reached Full Supply Level, all water flows into the dam must be released to protect the structural safety of the dam.

Seqwater has advised that, without major releases, there are negligible benefits to reducing volumes stored in North Pine or Leslie Harrison dams for the purposes of reducing the extent or duration of any downstream flooding impacts.

For North Pine Dam, there may be some operational and community benefits to minor releases to below Full Supply Level in some circumstances. Any gate operation at North Pine Dam results in inundation of Youngs Crossing Road, which isolates a number of residents. These impacts are currently being minimised by releasing from North Pine Dam at night. With further rainfall forecast, Seqwater may choose to reduce the level to below Full Supply Level in order to reduce the frequency of night releases or the likelihood of releases being required during the day.

For this dam, the SEQ Water Grid Manager has advised Seqwater that, from a water security perspective, it would not object to water being released to 97.5 per cent of storage capacity at any time until end March 2010.

For Leslie Harrison Dam, gate operations do not impact on public roads and generally only inconvenience the general public during large flood events. There is no scope to reduce this inconvenience through small pre-emptive releases. Accordingly, no in-principle approval be made for pre-emptive releases from this dam.

Trim Ref: D/10/8129

24 December 2010

Mr Peter Borrows
Chief Executive Officer
Seqwater
PO Box 16146
City East Qld 4002

Dear Mr Borrows

I refer to our letter of _ regarding the request from Minister Stephen Robertson to consider options to, and the benefits of releasing water from key storages in anticipation of major inflows over the coming summer period.

As you are aware, your officers have since provided advice about options and benefits.

I advise that, from a water security perspective, the SEQ Water Grid Manager has no in principle objection to minor releases from Wivenhoe, Somerset and North Pine dams to minimise the operational and community impacts of gate releases. Specifically, we have no in principle objection to:

- Wivenhoe and Somerset dams being drawn down to 95 per cent of their combined full supply level
- North Pine Dam being drawn down to 97.5 per cent of its full supply level.

Any specific releases to below Full Supply Level should be notified to myself or, if I am not available, the Director of Operations, SEQ Water Grid Manager.

Any releases should be managed by Seqwater in accordance with any statutory and regulatory obligations, such as the flood operations manuals and Resource Operations Plan. We recommend that you liaise with the Department of Environment and Resource Management to confirm any conditions that apply.

I acknowledge that these releases would have a negligible impact on the extent and duration of flooding during a major flood event. However, they may provide the ability to minimise the community and operational impacts of minor releases.

We have assessed the water security implications of the release to be negligible, having no impact on our ability to meet the risk criteria specified in the *South East Queensland System Operating Plan* or our ability to meet our supply obligations to SEQ Water Grid customers.

From a water security perspective, I am advised that the Queensland Water Commission also does not have any objections to the proposed release.

Please note that these arrangements are intended to apply for the current wet season only, taking into account the level of storages and the rainfall forecasts over coming months.

I am keen to continue to work with you to investigate the optimal arrangements for future wet seasons. In particular, I am keen to work with you to further investigate options that may reduce the frequency or duration of intermediate level flows (between 1,900 and 3,500 cubic metres per second). In addition, we recommend that the investigations with the Queensland Water Commission to examine the opportunity of raising the full supply level of Wivenhoe Dam for increased water supply be expanded to include options to lower the full supply level for managing flood events.

Thank you for your assistance in this matter. If you have any questions, please do not hesitate to contact Mr Dan Spiller, Director of Operations, by telephone or [redacted] or via email at [redacted]

Yours sincerely

Barry Dennien
Chief Executive Officer

Litsupport Brisbane

From: Barry Dennien
Sent: Friday, 24 December 2010 1:38 PM
To: Peter Borrows
Cc: Dan Spiller; Rob Drury

Peter

Please see attached letter with regards lowering Wivenhoe and North Pine Dams operating levels below full supply level to assist in flood mitigation.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
Phone: [redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

[redacted]

From: Barry Dennien
Sent: Friday, 24 December 2010 1:41 PM
To: [redacted]
Cc: Dan Spiller; [redacted]
Attachments: Letter to Minister - flood management.docx

Categories: T3

[redacted]

Please see attached letter with regards operating levels for Wivenhoe and North Pine Dams.

A letter will follow by mail

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

TRIM ref: D/10/7953

24 December 2010

Hon Stephen Robertson MP
Minister for Natural Resources, Mines and Energy
and Minister for Trade
PO Box 15216
Brisbane Qld 4001

Dear Minister

I am pleased to respond to your letter of 25 October 2010 regarding options to and benefits of releasing water from key storages in anticipation of major inflows over the current wet season. Our advice follows, based on discussions with Seqwater.

Only four of the dams in South East Queensland region are gated, with the ability to release significant amounts of water in anticipation of major inflows. These are Wivenhoe, Somerset, North Pine and Leslie Harrison dams.

Detailed operational procedures have been approved for each of the gated dams. The dams will continue to be operated in accordance with these procedures. These procedures generally relate to the management of the dams and should be managed above Full Supply Level. This advice relates to the water security aspect of the management of the dams below Full Supply Level.

Based on information currently available, Seqwater has advised that releasing water to below Full Supply Level may provide some benefits in terms of reduced community and operational impacts during minor inflow events, such as has occurred over the past month. For medium and major flood events, it considers that pre-emptive releases will provide negligible benefits.

Informed by this advice, the SEQ Water Grid Manager has advised Seqwater that, from a water security perspective, it has no in-principle objection to minor releases from Wivenhoe, Somerset and North Pine dams to minimise the operational and community impacts of gate releases. Specifically, it has advised that it has no in-principle objection to:

- Wivenhoe and Somerset dams being drawn down to 95 per cent of their combined Full Supply Level
- North Pine Dam being drawn down to 97.5 per cent of its Full Supply Level.

The SEQ Water Grid Manager has assessed the water security implications of the release to be negligible, having no impact on our ability to meet the risk criteria specified in the System Operating Plan or our ability to meet our supply obligations to Grid Customers. From a water security perspective, the Queensland Water Commission has also confirmed that it does not have any objections to the potential release.

Please note that these arranges are intended to apply for the current wet season only, taking into account the level of storages and the rainfall forecasts over coming months.

For future wet seasons, the SEQ Water Grid Manager will continue to work with Seqwater to investigate the optimal arrangements. In particular, we propose to further investigate options that may reduce the frequency or duration of intermediate level flows (between 1,900 and 3,500 cubic metres per second). In addition, we recommend that the investigations with the Queensland Water Commission to examine the opportunity of raising the full supply level of Wivenhoe Dam for water supply be expanded to include options involving the release of the additional water once major inflows are forecast.

I trust that this advice is sufficient. If you have any questions, please do not hesitate to contact Mr Dan Spiller, Director Operations, by telephone on [redacted] or by email on [redacted]

Yours sincerely

[redacted]

Chair

ATTACHMENT

Wivenhoe and Somerset dams

Wivenhoe Dam can store up to 1.15 million litres (ML) of drinking water. In addition, it has the capacity to store an additional 1.45 ML of flood water.

While large, the flood compartment can be filled within days. For example, following heavy rainfall in October 2010 Wivenhoe Dam received inflows equivalent to almost half of the flood storage compartment capacity in just a few days.

Several factors influence flood release strategies for Wivenhoe and Somerset dams.

First, rain events that have caused flooding have historically been prolonged events over several days, often with a second event occurring several days to a week after the first. As a result, the operational procedures for the dam are designed to ensure that all water held in the flood compartments is released within seven days of a rain event, ensuring that the flood compartment is available for any future inflows.

Secondly, the dam only controls flood waters from part of the Brisbane River catchment area. About 50 per cent of the catchment area of the Brisbane River is upstream of the Wivenhoe Dam wall, and can be potentially controlled by it. No flood mitigation structures exist for most of the potential run-off from the other 50 per cent of the catchment area.

Third, the Bureau of Meteorology has had limited success in plotting rainfall distribution accurately to assess where most flooding risk lies above or below the dam wall. Historical floods have demonstrated that flooding can occur from both. For example, the 1974 flood flows primarily occurred below the dam wall whilst the 1890's event occurred above the dam wall. As a result, when releasing water from Wivenhoe Dam it is very important to predict and monitor below the dam wall flows so as to understand combined river flows that cause flood impacts.

Taking these factors into account, the flood release strategy for Wivenhoe and Somerset dams has a hierarchy of objectives:

- Ensure the structural safety of the dam
- Provide optimum protection of urbanised areas from inundation
- Minimise disruption to rural life
- Retain full supply level after a flood event
- Minimise impacts to flora and fauna during the drain down phase.

Within this framework, flood releases from Wivenhoe Dam typically fall into two categories of flood events based on the impact they cause when combined with below the dam wall catchment runoff:

- Larger events typically involving combined river flows greater than 3,500 cubic meters per second measured at Moggill. These events would have flood impacts on urban areas in Brisbane. This scale of release has not been required since Wivenhoe Dam was completed.

- Smaller events with combined river flows of less than 1,900 cubic meters per second measured at the Mt Crosby weir which can inundate up to seven rural bridges isolating up to 50 households and causing inconvenience to many more. There has been six of these events since 1984, when Wivenhoe Dam was completed.

Our assessment of the benefits of lowering dam storage levels to reduce flooding impacts is below for these two event types.

Large events

Seqwater has advised that releases of greater than 3,500 cubic metres per second (m3/s) from Wivenhoe Dam are likely to impact on urban areas in Brisbane. Events of this nature have not been experienced since Wivenhoe Dam was completed in 1984.

Seqwater has advised that:

- pre-emptive releases are likely to have negligible impacts on the extent of these impacts
- any impacts would require releases of at least 250,000 ML. This is equivalent to a release of about 16 per cent of the combined storage capacity of Wivenhoe and Somerset dams.

A pre-emptive release of this scale is not recommended, based on information currently available. The potential water security impacts are considered to be more significant than the negligible benefits. These potential security impacts include costs associated with the earlier or avoidable operation of the desalination facility at capacity, as well as the increased probability of triggering the implementation of a drought response plan.

More detailed investigation of opportunities to actively manage flood storage is recommended, including options to increase flood supply level on a temporary basis. These investigations need to be led by Seqwater, and involve the Bureau of Meterology, Councils and the SEQ Water Grid Manager.

In particular, t has been identified that it is worth investigating the impacts on downstream flooding for intermediate level flows (flows between 1900 and 3500 cm^3/s).

Seqwater will undertake extensive investigations for the Queensland Water Commission in early 2011 to examine the opportunity of raising the full supply level of Wivenhoe Dam for water supply. We will recommended that the scope of this work be widened to consider the benefits of pre-lowering storage levels based on mid range rainfall events and the reduced impacts to river levels and subsequent property impacts. It is noted that predicting rainfall intensity and location, even as events are about to occur has not been accurate, however the Bureau of Meteorology is improving its methods.

Smaller events

Pre-emptive releases from Wivenhoe Dam may reduce the impacts of minor gate releases (strategies W1A to W1E in the operational procedures).

Minor gate releases may result in the closure of up to six bridges, isolating up to 50 dwellings and inconveniencing many more. As stated in existing flood management plans, releases should be managed to minimise the impacts on these residents. Over the immediate term, Councils have requested that bridge closures be avoided over the Christmas to New Year period, if at all possible. In addition:

- There are resource implications involved in the activation of the flood control centre. Under flood management plans, the centre must be staffed by suitability qualified officers at all times during gate releases. There are currently only four quality duty engineers, who have staffed the flood centre for much of period since the initial release in October.
- Gate releases during the Christmas holiday period would result in closure of dams to water based activities, impacting on up to 150,000 people who are expected to use the recreational facilities over the holiday period.

The Water Grid Manager has advised Seqwater that, from a water security perspective, it would not object to water being released from Wivenhoe and Somerset dams to 95 per cent of storage capacity at any time until end March 2010.

Under this recommendation, storage levels could potentially be reduced by up to about 77,250 ML. This is equivalent to the amount of water released between 13 and 16 December 2010, through a single gate.

Pre-emptive releases will be managed so as to minimise the likelihood of gate releases due to small storms and local rainfall. Storage capacity will usually be reduced through a combination of:

- Extended gate releases, especially for strategy W1C. For comparison, up to 130,000 ML/day was released during in November and mid December 2010. At this rate, the additional releases could occur in about half a day.
- Ongoing gate releases of up to 30,000 ML/day, which do not isolate any residents but can inundate some lower bridges that cause inconvenience.
- Ongoing valve release of up to about 4,300 ML/day, which can be maintained without inundate any bridges.

Actual releases would be decided by Seqwater based on operational considerations and in accordance with its statutory and regulatory obligations.

Water security impacts

The water security impacts of releases will be zero if the dams fill over the remainder of the wet season. Current forecasts indicate that there is a high probability of this occurring:

- Heavy rainfall is forecast over the Christmas holiday period, as noted above.
- Over the remainder of the wet season, advice from the Bureau of Meteorology is that sea surface temperatures are likely to remain at levels typical of a La Niña event into the first quarter of 2011, with the majority of the models indicating the event will gradually weaken over the coming months.

The water security impacts will be minimal, even if there were no further inflows to the dams. Modelling indicates that the reduction would have a minimal impact on the probability of key water Grid storages falling to 40 per cent of capacity over the next five years.

North Pine and Leslie Harrison dams

North Pine and Leslie Harrison dams do not have flood mitigation potential. Once the dams have reached Full Supply Level, all water flows into the dam must be released to protect the structural safety of the dam.

Seqwater has advised that, without major releases, there are negligible benefits to reducing volumes stored in North Pine or Leslie Harrison dams for the purposes of reducing the extent or duration of any downstream flooding impacts.

For North Pine Dam, there may be some operational and community benefits to minor releases to below Full Supply Level in some circumstances. Any gate operation at North Pine Dam results in inundation of Youngs Crossing Road, which isolates a number of residents. These impacts are currently being minimised by releasing from North Pine Dam at night. With further rainfall forecast, Seqwater may choose to reduce the level to below Full Supply Level in order to reduce the frequency of night releases or the likelihood of releases being required during the day.

For this dam, the SEQ Water Grid Manager has advised Seqwater that, from a water security perspective, it would not object to water being released to 97.5 per cent of storage capacity at any time until end March 2010.

For Leslie Harrison Dam, gate operations do not impact on public roads and generally only inconvenience the general public during large flood events. There is no scope to reduce this inconvenience through small pre-emptive releases. Accordingly, no in-principle approval be made for pre-emptive releases from this dam.

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Friday, 24 December 2010 2:19 PM
To: Barry Dennien; Peter Borrows
Cc: Dan Spiller
Subject: Re:

Barry can you resend as no attachment this end. Thanks.

From: Barry Dennien [redacted]
To: Peter Borrows
Cc: Dan Spiller [redacted]; Rob Drury
Sent: Fri Dec 24 13:37:45 2010
Subject:

Peter

Please see attached letter with regards lowering Wivenhoe and North Pine Dams operating levels below full supply level to assist in flood mitigation.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this

email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Litsupport Brisbane

From: Barry Dennien
Sent: Friday, 24 December 2010 2:33 PM
To: [redacted]
Cc: Dan Spiller
Subject: FW: Wivenhoe Dam levels
Attachments: Seqwater letter re Min s request on options for release of water.docx

Rob

Sorry not sure what happened there.

See document with regards lowering the levels of Wivenhoe and North Pine Dams below full supply level over this coming wet season to assist in flood mitigation.

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Trim Ref: D/10/8129

24 December 2010

Mr Peter Borrows
Chief Executive Officer
Seqwater
PO Box 16146
City East Qld 4002

Dear Mr Borrows

I refer to our letter of regarding the request from Minister Stephen Robertson to consider options to, and the benefits of releasing water from key storages in anticipation of major inflows over the coming summer period.

As you are aware, your officers have since provided advice about options and benefits.

I advise that, from a water security perspective, the SEQ Water Grid Manager has no in principle objection to minor releases from Wivenhoe, Somerset and North Pine dams to minimise the operational and community impacts of gate releases. Specifically, we have no in principle objection to:

- Wivenhoe and Somerset dams being drawn down to 95 per cent of their combined full supply level
- North Pine Dam being drawn down to 97.5 per cent of its full supply level.

Any specific releases to below Full Supply Level should be notified to myself or, if I am not available, the Director of Operations, SEQ Water Grid Manager.

Any releases should be managed by Seqwater in accordance with any statutory and regulatory obligations, such as the flood operations manuals and Resource Operations Plan. We recommend that you liaise with the Department of Environment and Resource Management to confirm any conditions that apply.

I acknowledge that these releases would have a negligible impact on the extent and duration of flooding during a major flood event. However, they may provide the ability to minimise the community and operational impacts of minor releases.

We have assessed the water security implications of the release to be negligible, having no impact on our ability to meet the risk criteria specified in the *South East Queensland System Operating Plan* or our ability to meet our supply obligations to SEQ Water Grid customers.

From a water security perspective, I am advised that the Queensland Water Commission also does not have any objections to the proposed release.

Please note that these arrangements are intended to apply for the current wet season only, taking into account the level of storages and the rainfall forecasts over coming months.

I am keen to continue to work with you to investigate the optimal arrangements for future wet seasons. In particular, I am keen to work with you to further investigate options that may reduce the frequency or duration of intermediate level flows (between 1,900 and 3,500 cubic metres per second). In addition, we recommend that the investigations with the Queensland Water Commission to examine the opportunity of raising the full supply level of Wivenhoe Dam for increased water supply be expanded to include options to lower the full supply level for managing flood events.

Thank you for your assistance in this matter. If you have any questions, please do not hesitate to contact Mr Dan Spiller, Director of Operations, by telephone on (0[redacted] or via email at [redacted]

Yours sincerely

Barry Dennien
Chief Executive Officer

Litsupport Brisbane

From: Barry Dennien
Sent: Friday, 24 December 2010 4:53 PM
To: Peter Borrows
Cc: Dan Spiller
Subject: Re: Wivenhoe Dam levels

Peter
Sorry for fast process around this Xmas and the forecast weather has made it necessary

You are right Seqwater can release down to the levels below fsl outlined in the letter all we ask is to be notified

This permission is from today and does not instruct you to manage to these levels it just gives you more flexibility in your decision making

Regards
Barry Dennien

On 24/12/2010, at 4:31 PM, "Peter Borrows [redacted] wrote:

> Hello Barry.
>
> My reading of your letter is that you have no objection to Seqwater releasing water from Wivenhoe/Somerset and NP to levels below full water supply level (FSL). As you are aware, our operating procedures are to release to FSL.
>
> To be clear, is your letter dated 24 December meant to be a direction to release to levels below FSL for these storages?
>
> Regards Peter
>
> ---
>
> **From**: Barry Dennien [redacted]
> **To**: Peter Borrows; Rob Drury
> **Sent**: Fri Dec 24 14:38:32 2010
> **Subject**: FW: Wivenhoe Dam levels
>
> ---
>
> **From:** Barry Dennien
> **Sent:** Friday, 24 December 2010 2:32 PM
> **To:** [redacted]
> **Cc:** Dan Spiller
> **Subject:** FW: Wivenhoe Dam levels
>
> Rob
>
> Sorry not sure what happened there.

See document with regards lowering the levels of Wivenhoe and North Pine Dams below full supply level over this coming wet season to assist in flood mitigation.

Regards

Barry Dennien

Chief Executive Officer

SEQ Water Grid Manager

Phone: [redacted]

Email: [redacted]

Visit: Level 15, 53 Albert Street, Brisbane

Post: PO Box 16205, City East Qld 4002

ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

<Seqwater letter re Min s request on options for release of water.docx>

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

TRIM ref: D/10/7953

24 December 2010

Hon Stephen Robertson MP
Minister for Natural Resources, Mines and Energy
and Minister for Trade
PO Box 15216
Brisbane Qld 4001

Dear Minister

I am pleased to respond to your letter of 25 October 2010 regarding options to and benefits of releasing water from key storages in anticipation of major inflows over the current wet season. Our advice follows, based on discussions with Seqwater.

Only four of the dams in South East Queensland region are gated, with the ability to release significant amounts of water in anticipation of major inflows. These are Wivenhoe, Somerset, North Pine and Leslie Harrison dams.

Detailed operational procedures have been approved for each of the gated dams. The dams will continue to be operated in accordance with these procedures. These procedures generally relate to the management of the dams and should be managed above Full Supply Level. This advice relates to the water security aspect of the management of the dams below Full Supply Level.

Based on information currently available, Seqwater has advised that releasing water to below Full Supply Level may provide some benefits in terms of reduced community and operational impacts during minor inflow events, such as has occurred over the past month. For medium and major flood events, it considers that pre-emptive releases will provide negligible benefits.

Informed by this advice, the SEQ Water Grid Manager has advised Seqwater that, from a water security perspective, it has no in-principle objection to minor releases from Wivenhoe, Somerset and North Pine dams to minimise the operational and community impacts of gate releases. Specifically, it has advised that it has no in-principle objection to:

- Wivenhoe and Somerset dams being drawn down to 95 per cent of their combined Full Supply Level
- North Pine Dam being drawn down to 97.5 per cent of its Full Supply Level.

The SEQ Water Grid Manager has assessed the water security implications of the release to be negligible, having no impact on our ability to meet the risk criteria specified in the System Operating Plan or our ability to meet our supply obligations to Grid Customers. From a water security perspective, the Queensland Water Commission has also confirmed that it does not have any objections to the potential release.

Please note that these arranges are intended to apply for the current wet season only, taking into account the level of storages and the rainfall forecasts over coming months.

For future wet seasons, the SEQ Water Grid Manager will continue to work with Seqwater to investigate the optimal arrangements. In particular, we propose to further investigate options that may reduce the frequency or duration of intermediate level flows (between 1,900 and 3,500 cubic metres per second). In addition, we recommend that the investigations with the Queensland Water Commission to examine the opportunity of raising the full supply level of Wivenhoe Dam for water supply be expanded to include options involving the release of the additional water once major inflows are forecast.

I trust that this advice is sufficient. If you have any questions, please do not hesitate to cont[redacted]r Operations, by telephone o[redacted]r by email on [redacted]

Yours sincerely

[redacted]

Chair

ATTACHMENT

Wivenhoe and Somerset dams

Wivenhoe Dam can store up to 1.15 million litres (ML) of drinking water. In addition, it has the capacity to store an additional 1.45 ML of flood water.

While large, the flood compartment can be filled within days. For example, following heavy rainfall in October 2010 Wivenhoe Dam received inflows equivalent to almost half of the flood storage compartment capacity in just a few days.

Several factors influence flood release strategies for Wivenhoe and Somerset dams.

First, rain events that have caused flooding have historically been prolonged events over several days, often with a second event occurring several days to a week after the first. As a result, the operational procedures for the dam are designed to ensure that all water held in the flood compartments is released within seven days of a rain event, ensuring that the flood compartment is available for any future inflows.

Secondly, the dam only controls flood waters from part of the Brisbane River catchment area. About 50 per cent of the catchment area of the Brisbane River is upstream of the Wivenhoe Dam wall, and can be potentially controlled by it. No flood mitigation structures exist for most of the potential run-off from the other 50 per cent of the catchment area.

Third, the Bureau of Meteorology has had limited success in plotting rainfall distribution accurately to assess where most flooding risk lies above or below the dam wall. Historical floods have demonstrated that flooding can occur from both. For example, the 1974 flood flows primarily occurred below the dam wall whilst the 1890's event occurred above the dam wall. As a result, when releasing water from Wivenhoe Dam it is very important to predict and monitor below the dam wall flows so as to understand combined river flows that cause flood impacts.

Taking these factors into account, the flood release strategy for Wivenhoe and Somerset dams has a hierarchy of objectives:

- Ensure the structural safety of the dam
- Provide optimum protection of urbanised areas from inundation
- Minimise disruption to rural life
- Retain full supply level after a flood event
- Minimise impacts to flora and fauna during the drain down phase.

Within this framework, flood releases from Wivenhoe Dam typically fall into two categories of flood events based on the impact they cause when combined with below the dam wall catchment runoff:

- Larger events typically involving combined river flows greater than 3,500 cubic meters per second measured at Moggill. These events would have flood impacts on

urban areas in Brisbane. This scale of release has not been required since Wivenhoe Dam was completed.

- Smaller events with combined river flows of less than 1,900 cubic meters per second measured at the Mt Crosby weir which can inundate up to seven rural bridges isolating up to 50 households and causing inconvenience to many more. There has been six of these events since 1984, when Wivenhoe Dam was completed.

Our assessment of the benefits of lowering dam storage levels to reduce flooding impacts is below for these two event types.

Large events

Seqwater has advised that releases of greater than 3,500 cubic metres per second (m3/s) from Wivenhoe Dam are likely to impact on urban areas in Brisbane. Events of this nature have not been experienced since Wivenhoe Dam was completed in 1984.

Seqwater has advised that:

- pre-emptive releases are likely to have negligible impacts on the extent of these impacts
- any impacts would require releases of at least 250,000 ML. This is equivalent to a release of about 16 per cent of the combined storage capacity of Wivenhoe and Somerset dams.

A pre-emptive release of this scale is not recommended, based on information currently available. The potential water security impacts are considered to be more significant than the negligible benefits. These potential security impacts include costs associated with the earlier or avoidable operation of the desalination facility at capacity, as well as the increased probability of triggering the implementation of a drought response plan.

More detailed investigation of opportunities to actively manage flood storage is recommended, including options to increase flood supply level on a temporary basis. These investigations need to be led by Seqwater, and involve the Bureau of Meterology, Councils and the SEQ Water Grid Manager.

In particular, t has been identified that it is worth investigating the impacts on downstream flooding for intermediate level flows (flows between 1900 and 3500 cm^3/s).

Seqwater will undertake extensive investigations for the Queensland Water Commission in early 2011 to examine the opportunity of raising the full supply level of Wivenhoe Dam for water supply. We will recommended that the scope of this work be widened to consider the benefits of pre-lowering storage levels based on mid range rainfall events and the reduced impacts to river levels and subsequent property impacts. It is noted that predicting rainfall intensity and location, even as events are about to occur has not been accurate, however the Bureau of Meteorology is improving its methods.

Smaller events

Pre-emptive releases from Wivenhoe Dam may reduce the impacts of minor gate releases (strategies W1A to W1E in the operational procedures).

Minor gate releases may result in the closure of up to six bridges, isolating up to 50 dwellings and inconveniencing many more. As stated in existing flood management plans, releases should be managed to minimise the impacts on these residents. Over the immediate term, Councils have requested that bridge closures be avoided over the Christmas to New Year period, if at all possible. In addition:

- There are resource implications involved in the activation of the flood control centre. Under flood management plans, the centre must be staffed by suitability qualified officers at all times during gate releases. There are currently only four quality duty engineers, who have staffed the flood centre for much of period since the initial release in October.
- Gate releases during the Christmas holiday period would result in closure of dams to water based activities, impacting on up to 150,000 people who are expected to use the recreational facilities over the holiday period.

The Water Grid Manager has advised Seqwater that, from a water security perspective, it would not object to water being released from Wivenhoe and Somerset dams to 95 per cent of storage capacity at any time until end March 2010.

Under this recommendation, storage levels could potentially be reduced by up to about 77,250 ML. This is equivalent to the amount of water released between 13 and 16 December 2010, through a single gate.

Pre-emptive releases will be managed so as to minimise the likelihood of gate releases due to small storms and local rainfall. Storage capacity will usually be reduced through a combination of:

- Extended gate releases, especially for strategy W1C. For comparison, up to 130,000 ML/day was released during in November and mid December 2010. At this rate, the additional releases could occur in about half a day.
- Ongoing gate releases of up to 30,000 ML/day, which do not isolate any residents but can inundate some lower bridges that cause inconvenience.
- Ongoing valve release of up to about 4,300 ML/day, which can be maintained without inundate any bridges.

Actual releases would be decided by Seqwater based on operational considerations and in accordance with its statutory and regulatory obligations.

Water security impacts

The water security impacts of releases will be zero if the dams fill over the remainder of the wet season. Current forecasts indicate that there is a high probability of this occurring:

- Heavy rainfall is forecast over the Christmas holiday period, as noted above.
- Over the remainder of the wet season, advice from the Bureau of Meteorology is that sea surface temperatures are likely to remain at levels typical of a La Niña event into the first quarter of 2011, with the majority of the models indicating the event will gradually weaken over the coming months.

The water security impacts will be minimal, even if there were no further inflows to the dams. Modelling indicates that the reduction would have a minimal impact on the probability of key water Grid storages falling to 40 per cent of capacity over the next five years.

North Pine and Leslie Harrison dams

North Pine and Leslie Harrison dams do not have flood mitigation potential. Once the dams have reached Full Supply Level, all water flows into the dam must be released to protect the structural safety of the dam.

Seqwater has advised that, without major releases, there are negligible benefits to reducing volumes stored in North Pine or Leslie Harrison dams for the purposes of reducing the extent or duration of any downstream flooding impacts.

For North Pine Dam, there may be some operational and community benefits to minor releases to below Full Supply Level in some circumstances. Any gate operation at North Pine Dam results in inundation of Youngs Crossing Road, which isolates a number of residents. These impacts are currently being minimised by releasing from North Pine Dam at night. With further rainfall forecast, Seqwater may choose to reduce the level to below Full Supply Level in order to reduce the frequency of night releases or the likelihood of releases being required during the day.

For this dam, the SEQ Water Grid Manager has advised Seqwater that, from a water security perspective, it would not object to water being released to 97.5 per cent of storage capacity at any time until end March 2010.

For Leslie Harrison Dam, gate operations do not impact on public roads and generally only inconvenience the general public during large flood events. There is no scope to reduce this inconvenience through small pre-emptive releases. Accordingly, no in-principle approval be made for pre-emptive releases from this dam.

JIM PROSS TELEPHONE CONVERSATION

+ CALL UP DAM SAFETY [illegible] REFLOWING || SAVES MONEY
  - [illegible] ON [illegible] EVENTS

+ INCREASE [illegible] INTERVALS

+ NORTH PINE ✓
  LESLIE HARRISON ✓
  WIVENHOE ✓

SOMERSET STAY [illegible]
- COULD SAVE

+ FULL AT BEGINNING OF WET SEASON

LESLIE HARRISON PRE-DROUGHT OPERATION 95/96 %

+ MODELLING SUPPORT

+ AIMS
  - [illegible]

+ MINIMISE VERY SMALL EVENTS
  PUBLIC INCONVENIENCE
  - ACTIVE MANAGEMENT STRATEGY
  - NUMBER AND DURATION

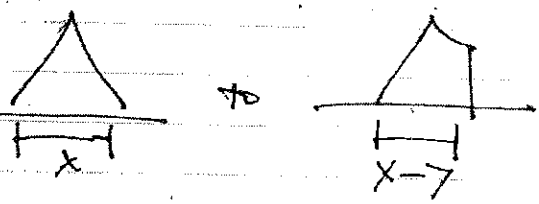
*? ENTITLEMENT WATER

BARRY
JIM PEISS
ROB DEWEY

DAM LEVELS 23 11 10

+ BOM RAINFALL IN PARTS OF MORETON CATCHMENT
  - PROXIMITY OF MAJOR EVENT
+ STORED WATER - DELAYED RELEASES
  BUT SAME PEAK

FLOODING DEPENDENT ON PEAK OUTFLOWS (MUD IN HOUSES)



THAT IS, FOR WIVENHOE IN 1974, MAY JUST HAVE DEFERRED PEAK BY 6 HOURS

+ FREQUENCY OF MID-RANGE ~~low~~ EVENTS
  - DAM ONLY
  - DAM AND DOWNSTREAM

+ NP?

+ ORIGINAL OBJECTIVES
  - REASONS FOR 3500 LIMIT?

+ NEEDS TO BE BIGGER THAN 1974 TO MAR FLOOD HOUSES

+ LOW PROBABILITY OF BOM ABLE TO FORECAST DAYS AHEAD

+ MINISTER ADVICE OUTLINE
  - THIS SUMMER...
  - POTENTIALLY FOR FUTURE...
  - PRE-EMPT OPERATIONAL STRATEGY NOT MORE...

+ HAVE TO BE GRADUAL FOR THIS SUMMER
  - MEANS PRE-EMPTIVE
  - LOW IMPACT OF BENEFIT



SEQ Water Grid

Operating Strategy

Version 3 – March 2011

A1

Document administration

Document version and modification control

Date	Author	Modification and/or action	Version
04.02.2011	[redacted]	Amendments to Draft October 2010 SEQ Water Grid Operating Strategy requested by the Queensland Water Commission and distributed to Grid Service Providers	3.0
25.02.2011	Daniel Spiller	Review of changes made prior to distribution to key stakeholders	3.1
07.03.2011	[redacted]	Review incorporating comments from key stakeholders	3.2
10.03.2011		Copy for final Board review	3.3
11.03.2011	Dan Spiller	Final for submission to the Queensland Water Commission	3.4
18.04.2011	[redacted]	Approved version incorporating QWC final comments	3.5

Document approval

Date	Name	Signature	Comments
11.03.2011	[redacted]		

Contents

Document administration 2
Contents 3
1.0 Introduction 5
1.1 Relationship to other plans and processes 6
1.2 Consultation 6
2.0 Regulatory framework 8
2.1 Operating Strategy requirements 8
2.2 Objectives and other operating requirements 9
2.3 Explanation of key concepts 11
3.0 Method 13
3.1 Inputs 16
Demand forecasts 16
Grid Capability 16
Security 17
Cost 17
Quality 17
Reliability 17
Other considerations 18
3.2 Decision making process 18
Step 1: Forecast demand 18
Step 2: Determine Water Grid capacity and availability 18
Step 3: Optimise security and cost 19
Step 4: Compliance and other considerations 21
3.3 Outputs 24
3.4 Grid Instruction process 24
4.0 Operating assessment 26
4.1 Demand scenarios (Step 1) 26
Climate outlook 26
Residential trends and scenarios 27
SEQ Water Strategy planning assumptions 27
Demand rebound precedents 31
Other demand assumptions 32
Consolidated demand scenarios 34
4.2 System capacity and constraints (Step 2) 36
Starting storage levels 36
Capacity and availability 38
Committed infrastructure 39
5.0 Operating Strategy 40
5.1 Security 40
Draw down of key storages 42
Operation of climate resilient supplies 42
Trigger to re-mobilise assets 44
Security assessment 45

5.2 Cost 48
Short-run variable costs 48
Other costs 49
5.3 Water quality 50
Detailed investigations 51
Disinfection by-product risks 53
Other chronic health and aesthetic risks 55
5.4 Reliability 56
5.5 Key elements by subregion 58
Northern South East Queensland 58
Central South East Queensland 60
Eastern South East Queensland 61
Southern South East Queensland 62
Demand zones with stand-alone supplies 63
Other 63
5.6 Refinement of the Operating Strategy 64
6.0 System Operating Plan compliance 66
6.1 Level of service objectives and risk criteria 66
6.2 Operating rules 68
Attachment 1: South East Queensland Water Strategy context 70
Level of service objectives 70
Level of service system yield 70
Drought response triggers 71
Climate change assumption 72
Attachment 2: Key Interface Points 74
Attachment 3: Preferred and alternative supply options by demand zone 81
Attachment 4: Operating Strategy requirements – Seqwater 88
Attachment 5: Operating Strategy requirements – LinkWater 92
Attachment 6: Operating Strategy requirements – WaterSecure 93
Attachment 7: SEQ Water Balance Model inputs 94
Attachment 8: SEQ Regional Water Balance Model outputs 98
Attachment 9: Future assessments and decisions points 99
Attachment 10: Production and Transfer Forecast for 2011–2012 Financial Year 103

1.0 Introduction

The SEQ Water Grid Operating Strategy (Operating Strategy) is created under the *South East Queensland System Operating Plan* (System Operating Plan). This is the third version of the Operating Strategy. It will commence upon being approved by the Queensland Water Commission (the Commission).

The System Operating Plan states that the Operating Strategy must include:

- details of how the Water Grid Manager intends to supply water to meet the forecast demands of each of its customers, including intended sources of supply, bulk water transfer arrangements and the cost effective and efficient operation proposal
- details of assumptions adopted to support the proposed Operating Strategy
- any additional information supporting the proposed Operating Strategy.

The Operating Strategy must demonstrate that all reasonable actions have been taken to achieve the desired level of service objectives and risk criteria.

Consistent with the System Operating Plan the Operating Strategy will provide:

- the basis for monthly Grid Instructions
- direction for asset owners on operational requirements over the next 12 month period
- a summary of the expected performance of the Water Grid over a five year period, based on the proposed Operating Strategy conditions and under various inflow and demand scenarios.

The components of the Operating Strategy are:

- a summary of the requirements in the System Operating Plan (Section 2)
- an explanation of the decision support framework used to prepare the Operating Strategy and Grid Instructions in accordance with the System Operating Plan (Section 3)
- an explanation of the current operating context and capacity (Section 4)
- the proposed Operating Strategy, which will take effect if approved by the Commission (Section 5)
- an explanation of how the proposed Operating Strategy complies with System Operating Plan requirements (Section 6).

The operation of the Water Grid will be refined over forthcoming versions of the Operating Strategy. These refinements will seek to further reduce the cost of operations, while continuing to ensure compliance with the System Operating Plan and water quality requirements and having regard to system reliability. These refinements will be made following

detailed investigation of specific issues, in partnership with relevant Grid Service Providers and Grid Customers.

1.1 Relationship to other plans and processes

The Operating Strategy under the SOP is informed by other plans made under a number of regulations and market instruments. The plans are:

- SEQ Water Grid Quality Management Plan (Water Grid Quality Management Plan), which coordinates the management of water quality in South East Queensland. This plan ensures that the safety and aesthetic quality of drinking water is protected, that drinking water is delivered in accordance with the Australian Drinking Water Guidelines 2004 and that these outcomes are achieved in an efficient and effective manner, taking advantage of the options the Water Grid provides.
- SEQ Water Grid Demand Assessment, which summarises demand trends and presents demand scenarios for bulk water over a 1 to 10 year timeframe, including seasonal and peak demand. This assessment will incorporate forecasts provided by Grid Customers. The forecasts will be used for several purposes, including the Operating Strategy. The first demand assessment will be completed in early 2011.
- SEQ Water Grid Capability Statement, which summarises asset capability and reliability. The assessment will include an analysis of additional capacity that may be required over the next five years, in order to meet forecast demand. This analysis will inform annual advice to the Commission regarding regionally significant infrastructure needs. The first capability statement will be completed in early 2011 and will incorporate the SEQ Water Grid Performance Standard, approved by the Commission in 2010, but no longer required under The Market Rules SEQ Water Market (Market Rules).
- SEQ Water Grid Emergency Response Plan, which directs a coordinated effective response in the event of an incident, which meets the Water Grid definition of an 'emergency'.

1.2 Consultation

The System Operating Plan requires that the Water Grid Manager make reasonable endeavours to consult each entity to which the proposed Operating Strategy will apply.

Grid Service Providers were consulted on this version of the Operating Strategy. Consultation primarily related to:

- revised demand forecasts for the period January 2011 to June 2012
- operation of the Gold Coast Desalination Plant and Western Corridor Recycled Water Scheme over the short- to medium-term, as announced by Government in December 2010
- options to draw down key storages, as a means of reducing the ongoing operational impacts of the recent flood event, such as highly turbid source waters.

This consultation was in addition to regular consultation about specific operational issues and monthly Grid Instructions and in relation to the other documents listed in Section 1.1.

Consultation drafts were provided to Grid Service Providers before submission to the Commission.

2.0 Regulatory framework

The Operating Strategy is created under the System Operating Plan and must comply with requirements contained within it. It has been prepared having regard to other market instruments and the framework outlined in the *South East Queensland Water Strategy* (SEQ Water Strategy). These requirements are outlined below.

2.1 Operating Strategy requirements

The System Operating Plan requires that by 30 November and 31 May each year, the Water Grid Manager must submit to the Commission a proposed Operating Strategy for the next 12 month period. The Operating Strategy must demonstrate how security will be maintained over a five year timeframe.

The proposed Operating Strategy must include:

- details of how the Water Grid Manager intends to supply water to meet the forecast demands of each of its customers, including intended sources of supply, bulk water transfer arrangements and the cost effective and efficient operation proposal
- details of assumptions adopted to support the proposed Operating Strategy
- any additional information supporting the proposed Operating Strategy.

The Water Grid Manager must demonstrate that all reasonable actions have been integrated into the proposed Operating Strategy to achieve the:

- desired level of service objectives
- risk criteria.

The principal tool for demonstrating compliance with the desired level of service objectives and risk criteria is the South East Queensland regional water balance model (refer Section 3.2).

The Water Grid Manager must only issue Grid Instructions based on the approved Operating Strategy, unless otherwise directed in writing by the Commission.

In preparing a proposed Operating Strategy, the Water Grid Manager must make reasonable endeavours to consult each entity to which the proposed Operating Strategy will apply. In turn, the entities must comply with any reasonable written request from the Water Grid Manager to supply information that may assist it to fulfil its obligations.

2.2 Objectives and other operating requirements

The System Operating Plan includes a wide range of rules for operating the Water Grid. These rules specifically apply to the Operating Strategy and Grid Instructions.

Maximum volume

The maximum volume of water the Water Grid Manager may enter into contracts to sell is 450,000 megalitres per annum.

Level of service objectives

The Operating Strategy must include all reasonable actions to achieve the following level of service objectives:

- during normal operations sufficient water will be available to meet an average total urban demand of 375 litres per person per day (including residential, non-residential and system losses), of which 230 litres per person per day is attributed to residential demand
- medium level restrictions will not occur more than once every 25 years, on average
- medium level restrictions need only achieve a targeted reduction in consumption of 15 per cent (%) below the total consumption volume in normal operations
- the frequency of triggering drought response infrastructure will be not more than once every 100 years, on average
- the frequency that the total volume of water stored by all key Water Grid storages declines to 10% of their combined water storage capacity will be not more than once every 1000 years, on average
- the total volume of water stored by all key Water Grid storages must not be permitted to reach 5% of the combined total water storage capacity of these storages
- Wivenhoe, Hinze and Baroon Pocket dams must not be permitted to reach minimum operating levels
- it is expected that medium level restrictions will last longer than six months, no more than once every 50 years, on average.

Risk criteria

The Operating Strategy must include all reasonable actions to achieve the risk criteria contained in Table 2.

Table 2: Risk criteria

Volume of water stored by key Water Grid storages	Probability of reaching volume of water stored		
	Within 1 year	Within 3 years	Within 5 years
40%	Less than 0.2%	Not specified	Less than 5%
30%	Not specified	Less than 0.5%	Less than 1%

Operating rules

The Operating Strategy must comply with the following rules, summarised from Section 8 of the System Operating Plan.

8.1 cost effective and efficient operation rule

Subject to other rules, seek to optimise the cost effective and efficient operation of water supply works to deliver the required volumes of water.

8.2 Water security rule

When the volume of water stored by key Water Grid storages falls below 40% of the storage capacity of these storages:

- the supply of manufactured water from the South East Queensland (Gold Coast) Desalination Plant (Desalination Plant) shall be maximised
- the supply of manufactured water to Wivenhoe Dam from the Western Corridor Recycled Water Scheme shall be maximised, subject to appropriate approvals.

8.3 Rule for the supply of water to power stations

Subject to operational constraints, CS Energy Limited shall be supplied:

- water from the Western Corridor Recycled Water Scheme, before
- water from the Warrill Valley Water Supply Scheme, before
- water from Wivenhoe Dam.

Subject to operational constraints, Tarong Energy Corporation Limited shall be supplied:

- water from the Western Corridor Recycled Water Scheme, before
- water from Wivenhoe Dam.

8.4 Rule for supply via the Northern Pipeline Interconnector Stage 1

Subject to operational constraints, the supply of water via the Northern Pipeline Interconnector Stage 1 from within the Sunshine Coast Regional Council to areas shall be:

- zero when the volume of water stored by Baroon Pocket, Ewen Maddock, Cooloolabin, Poona and Wappa dams as a proportion of the total storage capacity of these dams is less than or equal to the volume of water stored by Wivenhoe, Somerset and North Pine dams as a proportion of their total storage capacity
- zero when the volume of water stored by Baroon Pocket, Ewen Maddock, Cooloolabin, Poona and Wappa dams is less than 70% of the total storage capacity of these dams

- up to 65 megalitres per day when the volume of water stored by Baroon Pocket, Ewen Maddock, Cooloolabin, Poona and Wappa dams is between 70% and 100% of the total storage capacity of these dams.

8.5 Rule for supply from Lake MacDonald and the Upper Mary Water Supply Scheme

The supply of water from Lake MacDonald and the Upper Mary Water Supply Scheme shall, subject to operational constraints, be in accordance with the following priorities:

- water is to be supplied from Lake MacDonald while the dam is overflowing and may continue to be supplied until the total volume of water stored by Lake MacDonald falls below 95% of capacity after an overflowing event, before
- water is to be supplied from the Upper Mary Water Supply Scheme, before
- water is to be supplied from Lake MacDonald.

8.6 Rule for supply within the Warrill Valley Water Supply Scheme

The supply of water under water entitlement numbers 103187, 103184 and 103203 shall be in accordance with the following conditions or any varied conditions approved by the Commission:

- water take is sourced from run of river flow
- Berry's Lagoon Weir is overflowing.

8.7 Rule for supply within the Logan River Water Supply Scheme

Water shall not be supplied under water entitlements held by the Water Grid Manager within the Logan River Water Supply Scheme to meet demands other than those of the towns of Beaudesert, Kooralbyn, Rathdowney, South Maclean and Jimboomba, when Maroon Dam is at or below 10,000 megalitres of water storage. This rule is subject to operational constraints or approval is provided by the Commission.

2.3 Explanation of key concepts

The SEQ Water Strategy provides context for key concepts contained in the System Operating Plan. Attachment 1 provides a summary of information provided about:

- Level of service objectives
- Level of service system yield
- drought response triggers
- climate change assumption.

The maximum volume of water the Water Grid Manager may enter into contracts to sell is 450,000 megalitres per annum in the current version of the System operating Plan.

3.0 Method

The Water Grid is a complex system of supplies and interconnections that can be operated in a range of different ways at a regional, subregional and demand zone scale. This system must be operated to achieve a range of often conflicting objectives with varying degrees of regulation and prescription.

This section describes the method by which the Operating Strategy is developed, as summarised in Figure 1. It explains:

- inputs to the Operating Strategy
- the process and systems through which this information is synthesised and a preferred Operating Strategy developed
- outputs of the Operating Strategy.

The inputs and process reflect the following key variables:

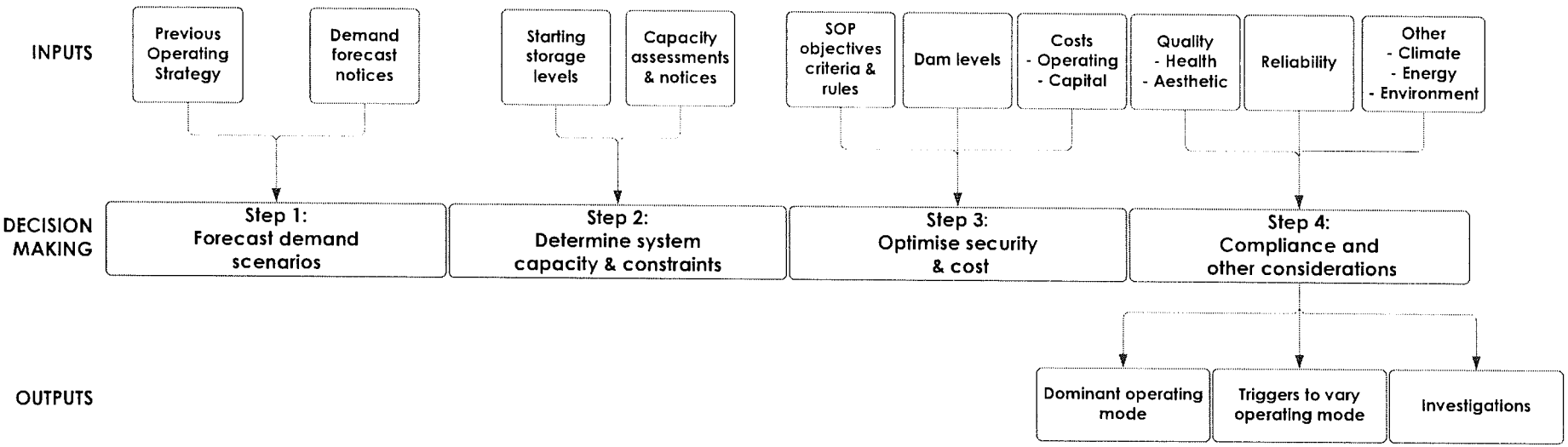
- demand – being the amount of water supplied to Grid Customers at bulk supply nodes
- capability – being potential system and asset throughput measured on an instantaneous or average basis
- security – being the availability of water to meet demand over the short to medium-term
- cost – being the whole of life costs of operating and augmenting the Water Grid to meet demand over the short to medium-term
- quality – measured as compliance with contractual requirements and the Australian Drinking Water Guidelines 2004 and including consideration of community expectations on aesthetic issues of taste, colour and odour
- reliability – being system and asset frequency and duration of failure.

A number of other factors are also taken into account as appropriate, ranging from weather forecasts and energy consumption to staff impacts and organisational knowledge.

These factors are considered across the Water Grid, as well as for subregions and demand zones. These subregions and demand zones are illustrated in Figure 2.

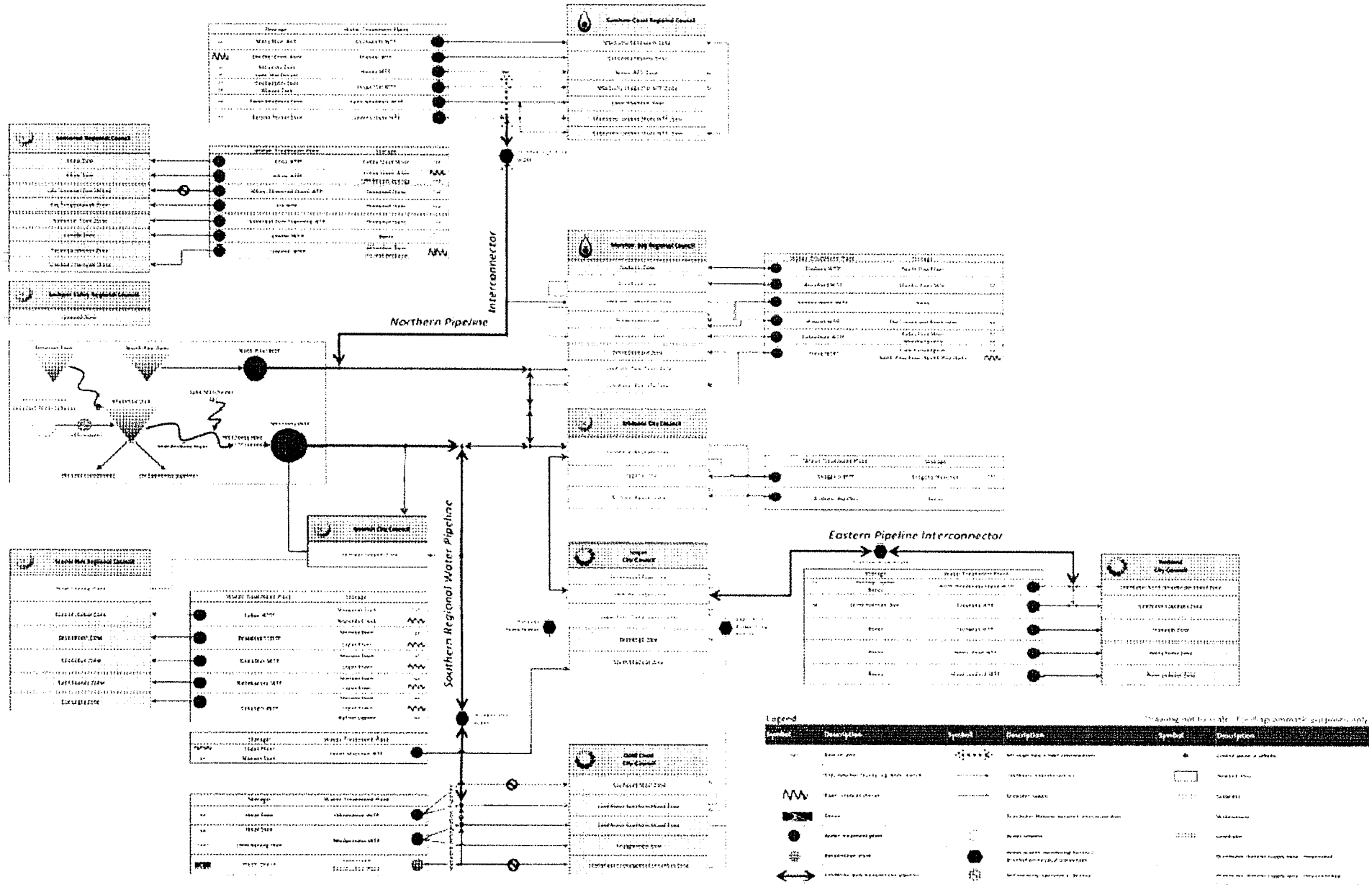
The decision making process is robust, contemporary and open to continuous improvement. At present, decision making is supported by a number of separate models, resulting in a linear process with a high degree of manual intervention. Over time, as additional information becomes available, decision making process will become increasingly complex. The Water Grid Manager is progressively developing optimisation models to accommodate this increased complexity, by integrating these existing models and providing for a more iterative optimisation process.

Figure 1: Operating Strategy inputs and decision making process



A14

Figure 2: Water Grid supply zones and assets



3.1 Inputs

The Operating Strategy is developed based on the following information. Additional information may be requested from Grid Service Providers as appropriate.

Demand forecasts

The Water Grid Manager receives demand forecasts from Grid Customers. Under the Market Rules, Grid Participants are required to submit:

- rolling 12 month demand forecasts by supply zone each month as part of the Grid Instruction process
- three year demand forecasts, mostly by council area, every year by 31 May under the Grid Contract Document.

The Water Grid Manager undertakes its own analysis of demand trends, focusing on seasonal variation and peaking factors.

Grid Capability

Each year, as required by the Market Rules, the Water Grid Manager undertakes a detailed assessment of Water Grid capability, based on advice from Grid Service Providers on their asset capability. This information continues to develop as Grid Service Providers continue to obtain an improved understanding of the capability and risks associated with operating the bulk water supply assets. Grid customer requirements are then assessed against the optimised combination of operation of Water Grid assets to determine the overall capability of the Water Grid. This assessment informs the *Annual Market Rules Review*, highlighting potential capability constraints over the short to medium-term.

Each month, the Water Grid Manager receives advice from Grid Service Providers about available capacity on a short-term basis, as part of the Grid Instruction process (capacity forecast notices). This advice focuses on short-term constraints that modify the commissioned capacity of assets, and may impact upon the capacity of the system as a whole. These constraints include:

- operating rules under the System Operating Plan and resource constraints such as water entitlements, including limits on transfers between subregions or extractions from particular water sources
- restricted supply due to water quality issues, such as due to algal blooms in a dam or waterway
- maintenance or refurbishment of key infrastructure components
- timeframes for recommissioning of assets or of full asset capacity, due to demobilisation.

In addition, the Operating Strategy takes into account committed system augmentations, based on the timeframes stated in the monthly project progress reports published by the Commission or as otherwise advised by Grid Participants.

Security

One of the largest drivers to water security at any given time is the available volume of supply. Given the large component of the supply that is made up from surface water storages, the amount of water stored in Seqwater's dams is a key input into the Security assessments. Dam storage levels are publicly reported by Seqwater on a daily basis.

Cost

The Operating Strategy primarily relies upon cost estimates that have been provided by Grid Service Providers specifically for this purpose. The estimates that have been provided to date are of unit costs for each water treatment plant and major interconnecting pipelines.

Increasingly, the Operating Strategy will be informed by detailed analysis of the costs of operating specific assets under different operating modes. This analysis will include consideration of future capital costs, which the Operating Strategy may influence the timing of. It may also include demobilisation costs, depending upon the operating options being considered.

The Operating Strategy will not impact upon return on and of capital within a regulatory period. However, it may avoid the need for capital expenditure and thereby defer or avoid future increases to the return on or of capital.

Quality

The Operating Strategy is informed by detailed water quality management plans.

For individual assets, the Water Grid Manager relies on the entity that owns the asset delivering water to comply with contractual requirements, which are based on the *Australian Drinking Water Guidelines 2004*. By July 2011, entities must have in place approved drinking water quality management plans.

For the system as a whole, the Operating Strategy is informed by, and complements, the Water Grid Quality Management Plan. Water quality issues are also addressed on a case by case basis in consultation with Grid Service Providers.

Reliability

The Water Grid Manager has commenced a detailed assessment of system reliability across the Water Grid. The assessment will be undertaken in collaboration with Grid Service Providers to identify critical failure modes and the risks of these failures occurring due to natural and man-made causes. It will identify potential water security impacts by supply zone, as an input to Operating Strategies and capital programs. The investigation will draw on the *SEQ Water Grid Performance Standard*, Strategic Asset Management Plans and Operating Protocols.

In the meantime, system reliability issues are being addressed on a case by case basis in consultation with Grid Service Providers.

Other considerations

A range of other issues can inform the preparation of the Operating Strategy, from climate forecasts and energy consumption to industrial relations and workforce planning. Information about these considerations is sought on a case by case basis as appropriate.

3.2 Decision making process

The Operating Strategy is developed through a four step process, as summarised below.

Step 1: Forecast demand

The first step involves the preparation of demand scenarios, based on the forecast notices provided by Grid Customers and other considerations. Multiple scenarios are prepared, including likely low and high series forecasts. The scenarios:

- are prepared for a five year period, with a focus on the first year
- are prepared for each demand zone, with summaries for each subregion and for the Water Grid as a whole
- take into account seasonal variation and peak periods, in order to ensure that sufficient capacity is available at all times
- take into account potential drought rebound scenarios
- allow for planned developments.

The five year period reflects the need to assess compliance with the risk criteria which apply out to a five year period.

Step 2: Determine Water Grid capacity and availability

The second step is to determine system capacity over the forecast period, based on current storage levels, the capacity assessment and notices and the timing of committed augmentations.

Water Grid capacity is influenced by previous Operating Strategies. For example, a decision to demobilise a small or aged supply will result in that facility not being immediately available.

Step 3: Optimise security and cost

First and foremost, the System Operating Plan seeks to always maintain water security. It achieves this through the specification of level of service objectives, risk criteria and operating rules, as outlined in Section 2.2. The System Operating Plan also requires that the most cost-efficient option be taken at any point in time in order to achieve this security.

These requirements are addressed as part of the third step, with the identification of proposed operating modes at the regional, subregional and demand zone level.

Water security

Water security is a function of:

- forecast demand
- stored water
- available treatment and transfer capacity, including climate resilient sources
- proposed operating philosophy
- planned augmentations.

From current storage levels, the System Operating Plan requires that all reasonable actions be taken to maintain the probability of key Water Grid storages reaching certain levels below the probabilities listed in Table 2. For example all reasonable actions are to be taken to ensure that the probability of reaching 40% of combined capacity is less than 5%.

When the probability is less than 5%, all options to reduce the costs of operating the Water Grid will need to be investigated, and implemented where appropriate. These options include:

- selling water to irrigators or adjoining areas on an interruptible basis
- reducing production from the generally more expensive small and aged supplies
- reducing production from more expensive climate resilient supplies
- altering the rate of transfer through major interconnections should they require relatively high energy intensive activities
- reducing the capacity required from Grid assets, in order to defer capital expenditure or to address water quality or reliability issues.

Some changes related to smaller sources in areas not connected to the wider supply system may not be able to be tested completely using the SEQ Regional Water Balance Model. However, the implication of increasing demand on larger regional supplies can be tested by assessing the change in the risk of those storages reaching low levels.

Preferred operating framework and operating modes

We identify a preferred operating framework across the Water Grid and preferred operating mode for each demand zone, having regard to:

- short-term demand across the Water Grid and for each supply zone, including seasonal and peak demand (Step 1)
- asset capacity and availability (Step 2)
- variable operating costs, over the short to medium-term
- options to reduce or defer capacity costs, including by demobilising small and aged assets
- compliance with water resource plan requirements
- additional revenue
- potential water quality implications of the various supply options.

Options are assessed as a portfolio, taking into account the costs and timeframes to bring capacity online as dam levels decline. Capital deferral options will be a key driver due to the magnitude of potential savings.

Sub-regional impacts are considered to ensure that regional security levels are achieved without placing a higher than desirable stress on a single subregion supply source. This subregional assessment will be used to formulate operating rules and triggers consistent with efficient and cost effective operation.

Triggers to vary operating modes

Within the connected Water Grid we can specify triggers to change the operating approach of key facilities. Variations may be required for a number of reasons, including:

- major changes to storage levels
- operating rules, such as for the Northern Pipeline Interconnector
- water quality issues, including for taste and odour
- reduce the likelihood of reaching levels outlined in the risk criteria.

SEQ Regional Water Balance Model

The SEQ Regional Water Balance Model is used to assess the security impacts of alternative operating portfolios.

This model uses stochastic data to generate longer time sequences of hydrologic data that have similar statistical characteristics to that of the historical record – providing better information about climate variability and the potential for droughts worse than have occurred on record.

For assessing compliance with level of service objectives, a long-term stochastic data sequence of 100,000 years is used. For assessing compliance with risk criteria, a series of 10,000 short-term climatic possibilities is used. The data sets have consistency in that both have the same statistical characteristics.

Long-term data sequences are used in order to predict the recurrence interval of an event on an annual basis, whereas short-term series data provides an ability to determine near future event probability. The long-term data set therefore defines specific event likelihood regardless of current conditions, and the short-term series the risk of occurrence based on specific current conditions. The outcomes are determined by hydrological and hydraulic mathematical simulation.

Step 4: Compliance and other considerations

The Water Grid provides the opportunity to manage water quality and asset reliability risks across the system as a whole. These opportunities are considered as part of Step 4, once a proposed operating mode has been identified based on optimising for water security and cost considerations alone (given demand scenarios and capacity and availability). A range of other issues may also be considered on a case by case basis, such as impacts on energy consumption.

These considerations may result in:

- changes to the dominant operating mode (that is, redoing Step 3)
- additional or alternative triggers to vary the operating mode
- initiating detailed investigations.

In some cases, these changes will increase the cost of operating the Water Grid. Where this occurs, we consider that the benefit of the change exceeds the cost.

Water quality

There are two broad elements to water quality, being health related issues and aesthetic issues. These elements must be considered for:

- bulk supply points, where water is supplied to SEQ Distributor-Retailers
- the customers tap, following distribution by the SEQ Distributor-Retailers.

Health related issues are treated as an absolute constraint on the system. That is, if a particular operational response needs to be taken to ensure water delivered to customers will be 100% health compliant, then those operational responses are undertaken regardless of cost. The Operating Strategy can manage health related issues by:

- not using particular water sources until capital or process improvements are undertaken
- maintaining minimum flows in major pipelines.

Aesthetic water quality issues are treated on a case by case basis, taking into account previous supplies, existing community expectations and the *Australian Drinking Water Guidelines 2004* values. This is achieved by balancing between the costs of production and transport and the benefits associated with alternative mitigating responses.

For aesthetic parameters, consistent with the Water Grid Quality Management Plan, the Operating Strategy seeks to ensure that water quality in any demand zone is no worse than what was delivered to the customers prior to the Water Grid being established. In many areas, quality has improved.

Reliability

Sufficient capacity must be available within the Water Grid to meet demand in the event that key assets failed. With the context of the Water Grid, the main issue of interest is the likelihood of an asset failing to an extent that demand cannot be met. Scenarios include:

- Unforeseen failures, such as a transformer explosion at a water treatment plant or a switchboard fire at a distribution pump station. Depending on circumstances such a failure might be equivalent to two days of water production.
- Foreseen partial failures, such as when temporary changes in raw water conditions reduce production rates. High dirt loads in the raw water supply associated with heavy rainfall events commonly has this impact.
- Bulk network failures, such as those associated with local power outages and mains bursts or when raw water conditions exceeds the treatment capacity at existing infrastructure, such as occurs at Mt Crosby water treatment plants in situations other than normal operation.

At this time, impacts on system reliability are being assessed on a case by case basis in consultation with Grid Service Providers.

Future versions of the Operating Strategy are expected to specify reliability targets for the Water Grid and key assets within it, based on the SEQ Water Grid Capacity Assessment and the requirements outlined in any Customer Code.

In addition, as information becomes available, options may be considered in relation to the ability of the Water Grid to continue to supply water to customers as required over shorter timeframes, such as hours and days. Specifically, the assessment would determine whether available supply storage in the network is sufficient for the time taken to implement the contingency option.

Other considerations

A range of other considerations potentially raised by other entities may also be taken into account as part of the Operating Strategy. These issues include:

- opportunities to reduce total energy consumption or energy consumption during peak periods
- impacts on staff, including as a result of demobilising assets
- maintaining operational expertise within each organisation.

These types of considerations may influence the preferred operating mode, or when it is implemented. For example, we may choose to continue to use a water treatment plant until staff can be transferred to a new plant that is being constructed nearby.

3.3 Outputs

The key outputs of this process are:

- specification of dominant operating modes across the Water Grid and for each demand zone (Attachment 3)
- specification of key infrastructure requirements by Grid Service Provider (Attachments 4, 5 and 6)
- a program of work to fully optimise the operation of the Water Grid (Section 6).

In addition, the Operating Strategy provides:

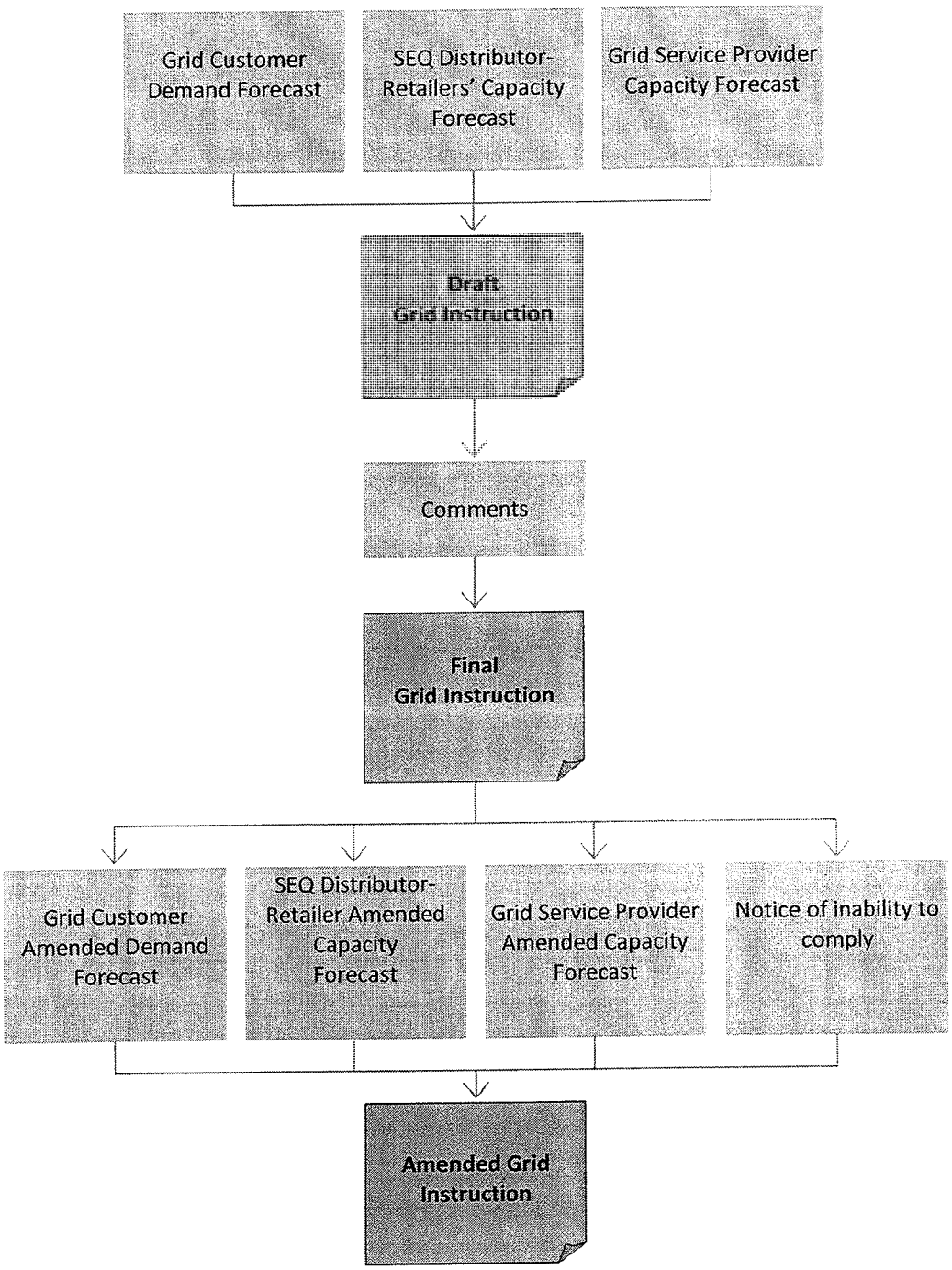
- a summary of detailed assumptions (Sections 4 and 5)
- evidence that it complies with the System Operating Plan requirements (Section 7).

The Operating Strategy will be refined over time in partnership with the Grid Service Providers to collectively achieve best practice operation of the Water Grid, and to be compliant with System Operating Plan requirements. Strategic operational requirements will be developed through a staged approach, selecting priority areas and utilising a sound project management delivery framework.

3.4 Grid Instruction process

The monthly Grid Instruction process applies the Operating Strategy based on forecast demand and capacity for that month, including coordination of maintenance and construction activities. The existing Grid Instruction process is illustrated in Figure 3, based on the requirements in the Market Rules.

Figure 3: Grid Instruction process



4.0 Operating assessment

Water supply to South East Queensland is now secure, due to key Water Grid storages being near full, key Water Grid projects complete and continued low levels of water consumption. This situation provides the opportunity to ensure the Water Grid is operated in a cost effective manner, while maintaining water quality and water security.

Climate outlook

There is a less than average probability of above median rainfall in South East Queensland for February to April 2011, based on advice from the Queensland Climate Change Centre of Excellence on 20 January 2011. This advice is based on the current and projected state of the El Niño-Southern Oscillation (ENSO) phenomenon, and on factors which modulate the impact of ENSO on Queensland rainfall, such as the Pacific Decadal Oscillation. However the confidence levels associated with this prediction are low, so caution is recommended when using this forecast.

The Southern Oscillation Index (SOI) has declined slightly over January but remains quite positive when averaged over the month to 14 February (20.2).
Observed sea surface temperatures in key regions continue to be cooler than normal – typical of an established La Niña pattern. However the areas where sea surface temperatures are more than 1 degree cooler than normal for this time of year has decreased and all sea surface temperature indices have warmed.

These indications and climate models surveyed by the Bureau of Meteorology indicate a gradual weakening of the La Nina conditions.

4.1 Demand scenarios (Step 1)

This section presents the demand scenarios used for this version of the Operating Strategy, which have been developed having regard to recent trends and the assumptions and measures outlined in the SEQ Water Strategy.

SEQ Water Strategy planning assumptions

The SEQ Water Strategy sets a planning assumption of regional urban consumption of an average of 375 litres per person per day (l/p/day), including an allowance of up to 230 l/p/day for residential use. It explains that this is a conservative assumption for the purposes of long-term water supply planning, taking into account the timeframes for delivering bulk water supply infrastructure and the level of uncertainty regarding such factors as the extent of permanent behavioural changes and the potential impacts of climate change. The SEQ Water Strategy assumes that demand will rebound to this level by 2018.

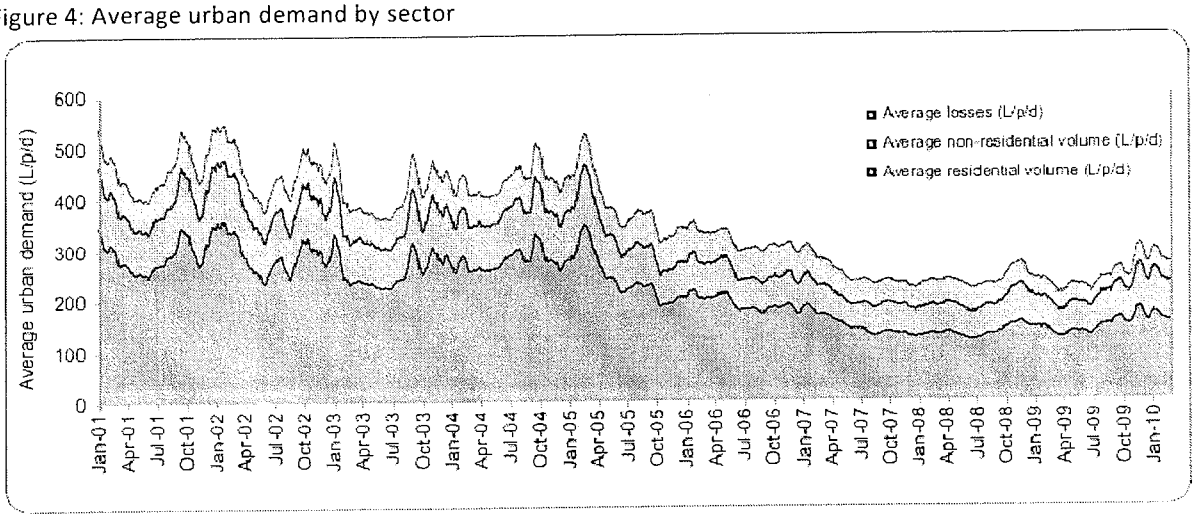
The SEQ Water Strategy also challenges residents to use less, voluntarily maintaining a regional average residential consumption below 200 l/p/day. It explains that, by maintaining consumption below this level, the need for new supplies could be deferred by at least five years.

Residential trends and scenarios

In South East Queensland, the most recent unrestricted consumption occurred prior to May 2005. Average total urban consumption at that time varied between local government areas, from 300 to 500 litres per day with an average of 450 litres per day. On average, residents of South East Queensland with reticulated drinking water supplies consumed approximately 300 litres per day.

Compared to pre-drought trends, both total consumption and seasonal variability have reduced, as illustrated in Figure 4. Reductions have been achieved in both residential and non-residential consumption, driven by a combination of structural and behavioural measures.

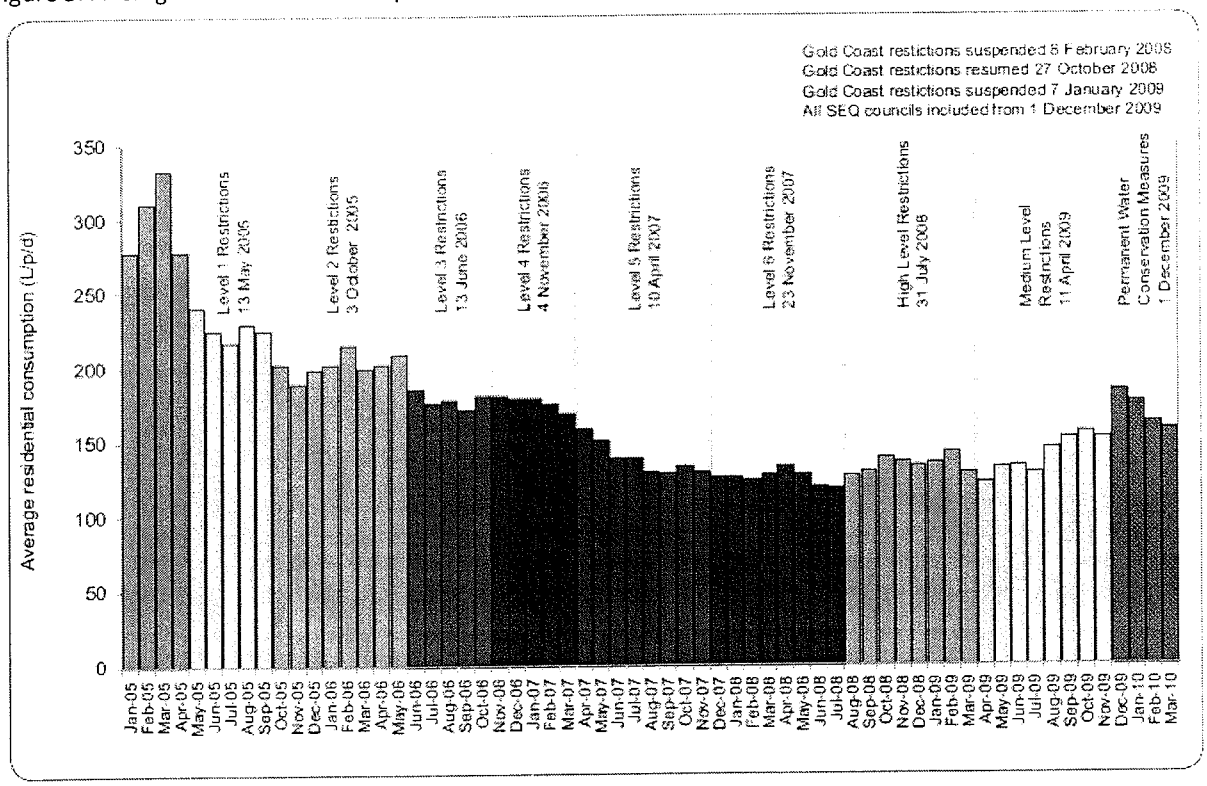
Figure 4: Average urban demand by sector



Source: SEQ Water Strategy (2010)

In the central South East Queensland and Gold Coast region, average residential consumption reduced to below 150 litres per day from early 2007 to late 2009, as illustrated in Figure 5.

Figure 5: Average residential consumption for areas under the Commission restrictions since 2005



Source: SEQ Water Strategy (2010)

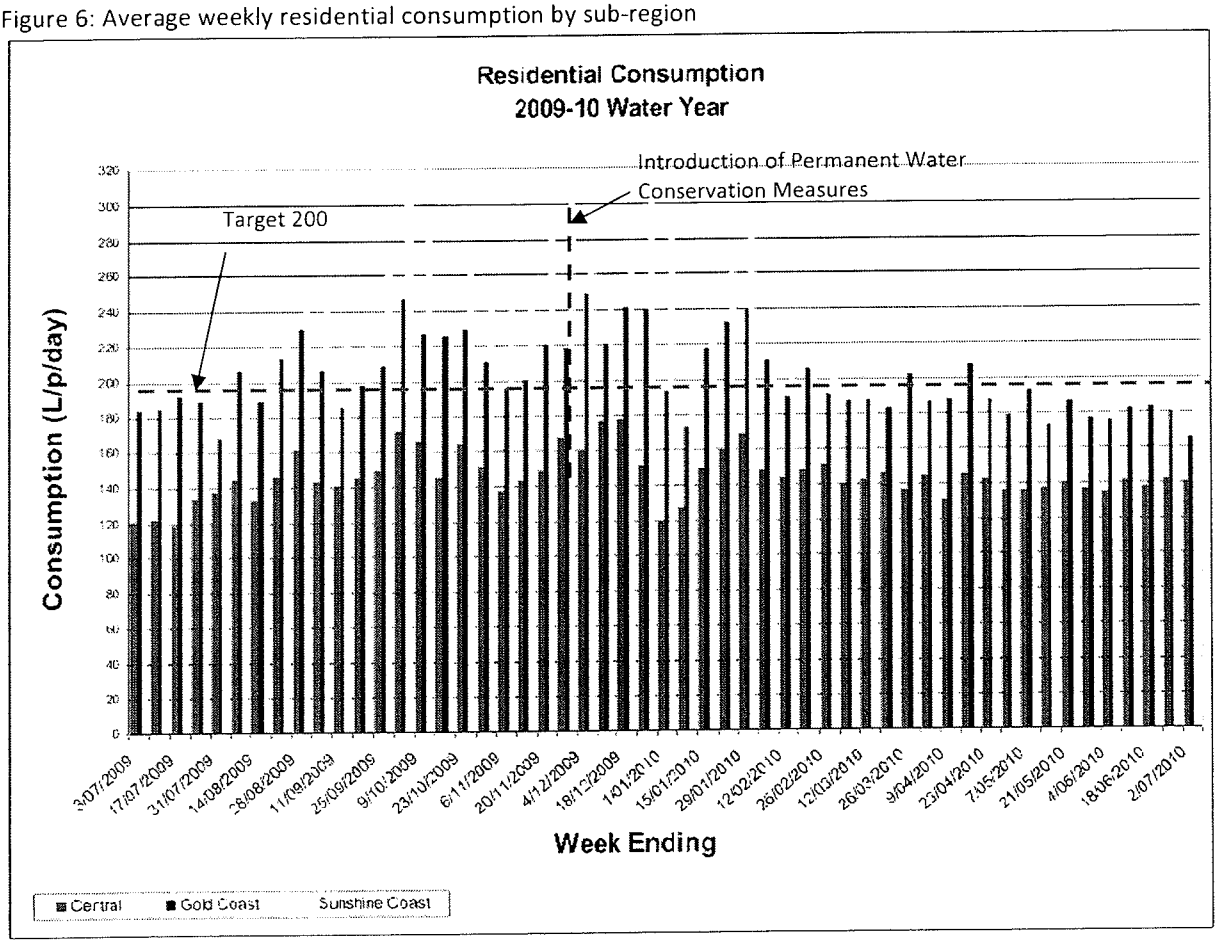
In central South East Queensland, restrictions on outdoor irrigation were eased on 1 December 2009, when permanent water conservation measures were introduced across South East Queensland. Elsewhere, the Gold Coast had been exempted from restrictions and the Sunshine Coast and Redland areas had not previously been subject to the Commission restrictions.

Since permanent water conservation measures were introduced, average residential consumption across South East Queensland has been about 160 litres per day, including in areas that were not previously subject to the Commission restrictions. This low consumption has occurred during a period of higher than average rainfall. As illustrated in Figure 6, average residential consumption:

- in central South East Queensland has remained constant at around 140–150 litres per day since early 2009, with 10–20 litres per day nominally being for outdoor irrigation (based on assumed average internal use of 130 litres per day)
- on the Gold Coast has averaged about 195 litres per day since early 2009, from which time it was exempted from Medium Level Restriction (averaging 65 litres per day for outdoor irrigation, based on the same assumption). Seven day average demand has varied between 124–249 litres per day. Both total consumption and variability provide an indication of the trends that may emerge in central South East Queensland over the short- to medium-term
- on the Sunshine Coast has averaged around 185 litres per day since early 2010, having reduced from up to 310 litres per day during dry weather in late 2009 (averaging 55 litres per day of outdoor irrigation, with peaks of up to 180 litres per day).

By comparison, the SEQ Water Strategy planning assumption of average regional residential use of 230 litres per day represents an increase of 90 litres per day over the drought consumption levels. This represents around two hours of outdoor water use per household per week, if indoor use remained at approximately the same level. Prior to the drought, residents of South East Queensland used on average more than 120 litres per day for outdoor irrigation.

Figure 6: Average weekly residential consumption by sub-region



For the purposes of informing this Operating Strategy the Water Grid Manager has estimated that the scale of the drought rebound will primarily be determined by the extent to which residents return to using drinking water supplies for outdoor irrigation. This is informed by the historic lowering of demand and decrease in variability that has resulted from the ongoing restrictions effecting behavioural aspects of water use and structural changes within water users' premises. In addition it is assumed that the timing of this rebound will primarily be determined by rainfall and, to a lesser extent, increasing water prices. Higher rainfall will both reduce the need for outdoor irrigation and replenish the many rainwater tanks that have been installed since 2005, dampening demand for water from the Water Grid for outdoor irrigation. We consider that this demand for Water Grid water for outdoor irrigation will be in addition to average internal water use of about 130 litres per day.

While significant increases in outdoor irrigation may occur in future during dry periods, it is considered unlikely over the next 12 months given recent trends and demand forecasts. On this basis, this version of the Operating Strategy is based on a low and a high demand scenario.

The low demand forecast is based on medium series population growth and average maximum temperature and rainfall, without an allowance for behavioural change. Forecasts were developed using a multiple factor linear regression analysis of metered water consumption for the period following the easing of restrictions for the various council areas across South East Queensland. Current behaviour is embedded in the analysis, both in the coefficients derived and in any skew to the fit of the regressions.

The factors considered for the regression analysis are:

- connected population
- maximum temperature
- rainfall
- school holidays.

Climate information was sourced from the Bureau of Meteorology.

The high demand scenario is based on the forecasts used for the base case in the SEQ Water Strategy. This forecast reflects an assumption that demand will grow from levels experienced in 2009 to a level consistent with a regional average consumption rate of 230 litres per day by 2018. Population growth is based on medium series forecasts, which are also used in the SEQ Water Strategy base demand scenario. This scenario is considered a more appropriate basis for medium-term operational decisions, noting that actual demand will vary between areas, seasons and years, and pending more detailed analysis for future versions of the Operating Strategy.

Actual demand will vary temporally as well as spatially, as illustrated by Figure 6 for the Gold Coast.

Demand rebound precedents

There are limited precedents against which to assess how much of the behavioural changes made during the Millennium Drought will be sustained in the future. As stated in the SEQ Water Strategy, the information available for recent droughts in Australia and overseas indicates that the rebound back to this level of consumption can be expected to occur gradually over a minimum of two years with maximum savings of 10 to 15%. However, we note that the extent and duration of demand reduction in South East Queensland exceeds that experienced in other major cities during severe drought. Price increases are also likely to be a more significant factor than following previous droughts.

Continued assessment of actual rebound in South East Queensland will be undertaken to inform updates to this Operating Strategy should the rebound be faster or slower than that currently estimated.

Other demand assumptions

Non-residential trends

In 2009, 32% less water was used by the non-residential sector than in 2004–5, saving 76.6 megalitres per day. These savings have been achieved despite the total number of businesses increasing by 16.9%.

In 2009–10, total non-residential consumption was about 59,000 ML, equivalent to 161 ML or about 60 litres per person per day. For this version of the Operating Strategy, non-residential demand:

- for the low demand scenario, has been assumed to continue at current rates with an allowance for population growth
- for the high demand scenario, increasing from 67 litres per day to a maximum of 92 litres per day as part of the SEQ Water Strategy forecasts.

System losses

System losses are currently about 70 megalitres per day. For this version of the Operating Strategy, losses:

- for the low demand scenario, has been assumed to remain relatively constant, with development generally offsetting the benefits of further pressure reduction and leakage management measures
- for the high demand scenario, 30 litres per day as part of the SEQ Water Strategy forecasts.

System losses include losses from authorised uses such as fire fighting and maintenance, as well as unauthorised uses such as theft and leakage. System losses have been reduced by about 60 megalitres per day since 2005.

Purified recycled water

The Water Grid Manager has contracts to supply up to 85 megalitres per day of purified recycled water to the Tarong Energy Corporation and CS Energy Limited. Actual demand over the next five years is likely to be significantly less:

- Tarong Energy Corporation is expected to take between 5 and 20 megalitres per day for use in the Tarong North Power Station
- CS Energy Limited has advised the Water Grid Manager of its intention to stage the closure of Swanbank B Power Station over the next two years. Its demand for purified recycled water having reduced to 14 mega litres per day in October 2010, demand is forecast to further reduce to 9 megalitres per day in May 2012 when the final closure occurs. This initial reduction has now occurred with demand for water being in the order of 14-15 megalitres per day (subject to local rainfall and water quality in Swanbank Lake).

The Water Grid Manager has not yet received demand forecast information for industrial or dual reticulation customers from the SEQ Distributor-Retailers. As a conservative measure, up to 125 megalitres per day of capacity is assumed to be available in the SEQ Regional Water Balance Model that can be taken up if needed. This is equal to the difference between the estimated available capacity of the Western Corridor Recycled Water Scheme and the power station demand forecasts. If these volumes were required due to additional significant customers coming online, there would be a need to bring all the advanced water treatment plants online. Actual industrial and dual reticulation demand is likely to be significantly less until at least mid 2011, at below 10 megalitres per day.

Options to supply purified recycled water to rural producers in the Lockyer Valley are being investigated, for possible inclusion in future versions of the Operating Strategy.

Rural production

The Operating Strategy assumes that rural producers use the full entitlements available to them. Actual rural use is likely to be less, due to under-utilised allocations and the absence of active trading markets at this time.

Opportunities to supply water to rural producers on an interruptible basis are being investigated, for possible inclusion in future versions of the Operating Strategy.

Supply to areas outside South East Queensland

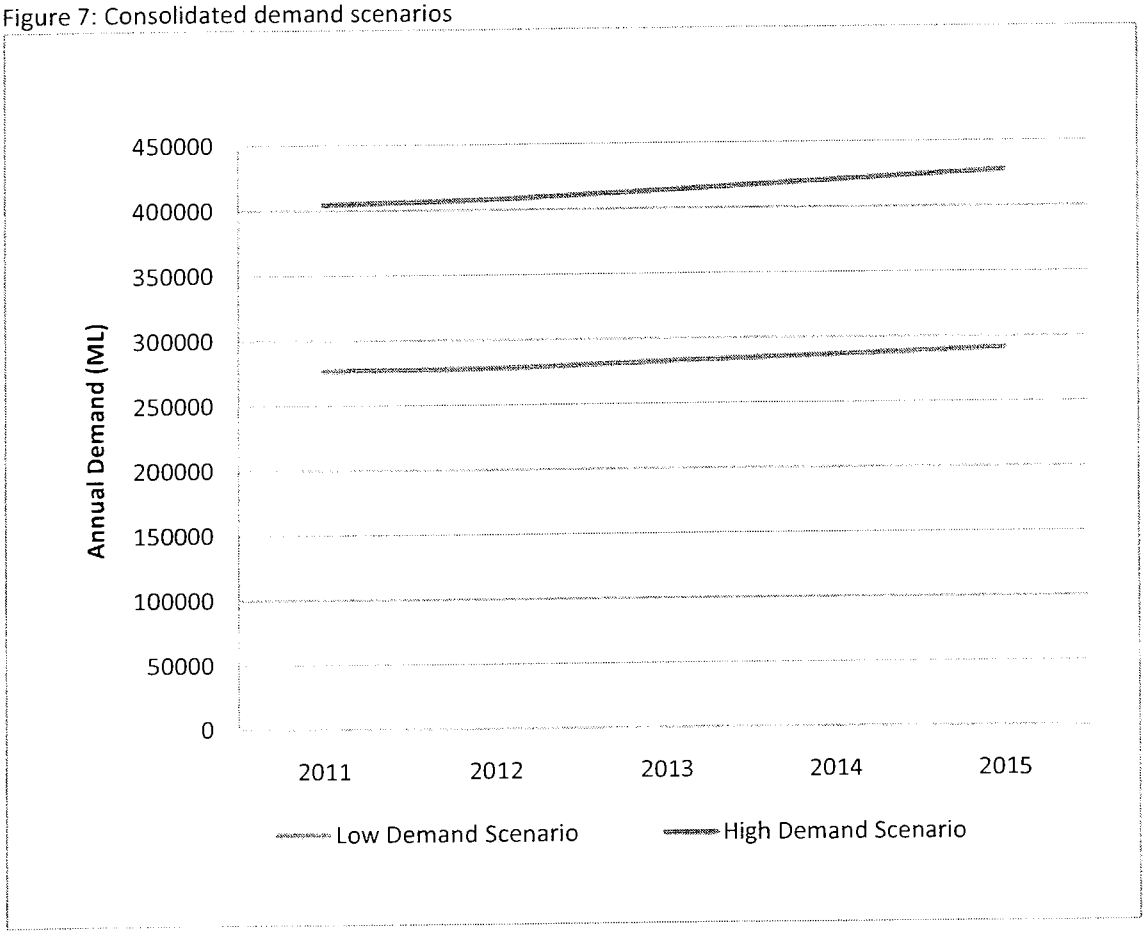
The Water Grid Manager is contracted to supply up to 10,000 megalitres per annum to Toowoomba Regional Council. Actual take is likely to be significantly less than the contracted value, over the timeframe of the Operating Strategy, due to local storages now being at full capacity. Toowoomba Regional Councils has set in place an operational approach to the pipeline that is based on sending minimum volumes required to maintain acceptable water quality of the raw water in the pipeline. This approach is also aimed at maintaining the operability of the pumping infrastructure.

Opportunities to supply water to other areas outside South East Queensland are being investigated. Any such supply would need to be taken into account in future versions of the Operating Strategy.

Consolidated demand scenarios

Total forecast demand is illustrated in Figure 7, for South East Queensland as a whole.

Figure 7: Consolidated demand scenarios



When preparing these assumptions, we had regard to the forecasts and assumptions provided by Grid Customers. However, the forecasts differ. For comparison, Figures 8a, 8b and 8c illustrate our forecasts and those provided by the SEQ Distributor-Retailers on an annual basis. Just as we are refining our forecasts, we also expect the SEQ Distributor-Retailers to do so, as an input to economic regulation. In the meantime, and mindful that the entities only recently commenced operation, we note that:

- The method used to prepare forecasts varies between and within entities. For example, Allconnex Water having provided forecasts from three separate models.
- Many of the underlying assumptions have not been stated, such as the assumed rate of population growth.
- Only one forecast has been provided for each area, which may not be appropriate for some purposes of the Operating Strategy. For example, some forecasts may be appropriate for identifying capacity constraints, but may exceed likely demand over the short-term.

Figure 8a: Comparison to forecasts provided by Unitywater

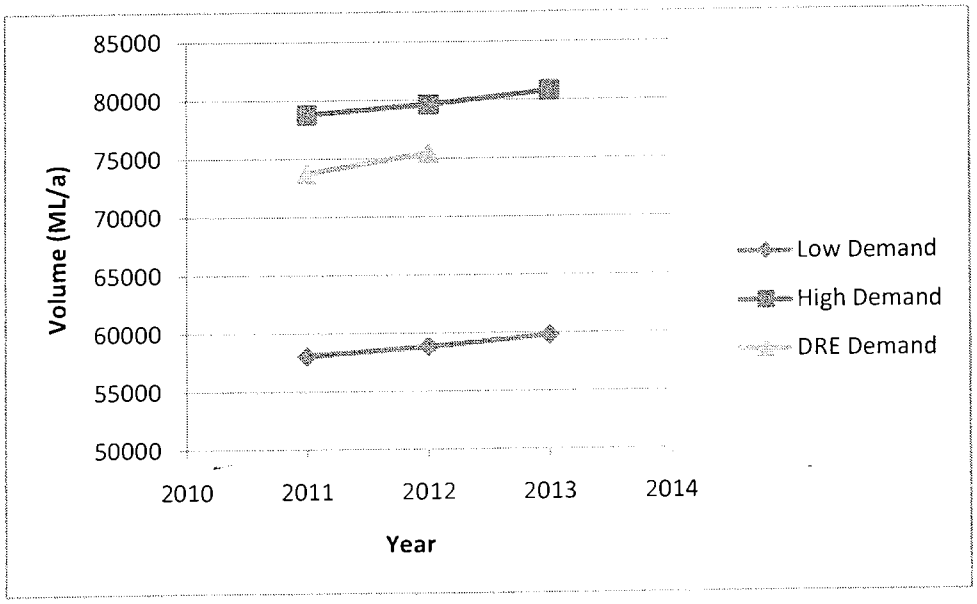


Figure 8b: Comparison to forecasts provided by Allconnex

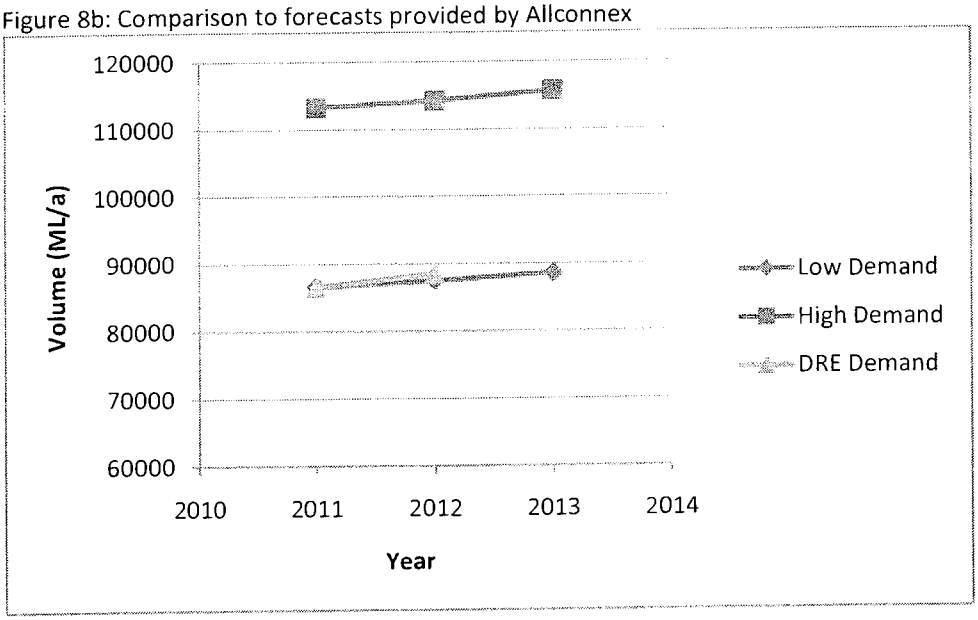
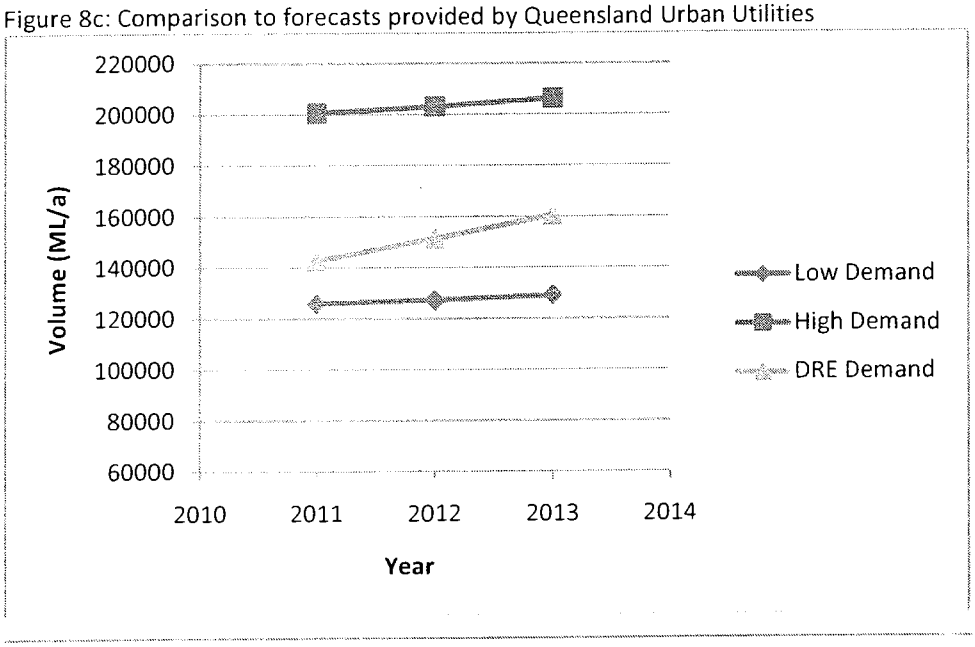


Figure 8c: Comparison to forecasts provided by Queensland Urban Utilities



For the assessment against the risk criteria specified in the System Operating Plan, both demand scenarios have been used, with details in the model files accompanying this submission.

For the assessment of the long-term level of service objectives, the demand forecast in the fifth year of the low demand scenario was used across the full duration of the simulation period. This resulted in a constant demand across the 117 years of the simulation, aside from monthly variation for the purpose of this long-term assessment. This approach is consistent with the way in which the long-term assessments were undertaken for the SEQ Water Strategy and SEQ Regional Water Security Program.

4.2 System capacity and constraints (Step 2)

The Operating Strategy was developed based on the following storage levels and infrastructure constraints.

Starting storage levels

Starting storage volumes as at 2 February 2011 are specified in Table 3. These volumes were used for the modelling and assessments supporting the development of this Operating Strategy.

The Grid Twelve storages are now 100% of combined storage capacity, following rainfall in late October 2010. As a result, security is slightly better than is represented in the assessments.

The Grid Twelve comprises approximately 90% of the total storage capacity of the Water Grid. It includes Wivenhoe, Somerset, North Pine, Hinze, Baroon Pocket, Leslie Harrison, Ewen Maddock, Cooloolabin, Lake Kurwongbah, Lake MacDonald, Little Nerang and Wappa dams. The Grid Three refers to the three largest dams, being Wivenhoe, Somerset and North Pine.

Table 3: Water Grid starting storage levels as at 2 February 2011

Storage	Storage capacity in megalitres (ML)	Storage level in February 2011 (ML)	Storage level in February 2011 (%)
Wivenhoe Dam[1]	1,165,200	1,165,200	100.0%
Somerset Dam	379,850	379,850	100.0%
North Pine Dam[2]	215,000	213,663	99.4%
Lake Kurwongbah	15,480	14,164	91.5%
Enoggera Dam	4,500	4,500	100.0%
Lake Manchester	26,000	26,000	100.0%
Central subregion	**1,760,050**	**1,758,713**	**99.9%**
Baroon Pocket Dam	61,000	61,000	100.0%
Borumba Dam	46,000	45,952	99.9%
Lake MacDonald	8,000	8,000	100.0%
Ewen Maddock Dam	16,700	16,587	99.3%
Cooloolabin Dam	14,200	13,820	97.3%
Wappa Dam	4,615	4,615	100.0%
Northern subregion	**150,515**	**149,974**	**99.6%**
Leslie Harrison Dam	24,800	24,450	98.6%
Eastern subregion	**24,800**	**24,450**	**98.6%**
Hinze Dam[2]	161,073	161,073	100.0%
Little Nerang Dam	6,671	6,671	100.0%
Southern subregion	**167,744**	**167,744**	**100.0%**
Maroon Dam	44,300	44,300	100.0%
Moogerah Dam	83,765	83,765	100.0%
Wyaralong Dam[3]	103, 000	90, 640	88.0%
Western subregion	**231,065**	**128,065**	**100.0%**
Grid 3	**1,760,050**	**1,758,713**	**99.9%**
Grid 12	**2,072,589**	**2,069,093**	**99.8%**
Total*	**2,380,154**	**2,228,946**	**99.9%**

Notes:

1 On 13 February 2011, Seqwater announced that Wivenhoe Dam would be temporarily reduced to 75% of its current full supply level. The water security impacts of this reduction are addressed in Section 6.

2 The Hinze Dam upgrade will increase the full supply level from 161,073 ML to 309,700 ML with additional flood mitigation capacity above this level. For water security assessments, the increased storage capacity has been included from December 2012 (refer below). This is a conservative assumption, with a possibility that the storage may fill prior to that date.

3 Wyaralong Dam filled during January 2011. For water security assessments, it is assumed to commence supply in 2015–16. The water treatment plant and connecting pipeline are scheduled to be commissioned from that time (refer below). Storage level is from 21 February 2011.

Table 4 lists the levels of Toowoomba storages and of Boondooma Dam. These storages are outside the Water Grid, but impact upon demand for water from it.

Table 4: Other storage levels as at 14 February 2011

Storage	Storage capacity (ML)	Storage level in February 2011 (ML)	Storage level in February 2011 (%)
Perseverance Dam	30,140	30,140	100.0%
Cressbrook Dam	81,842	80,610	98.5%
Cooby Creek Dam	21,177	19,672	92.9%
Toowoomba storages total	**133,159**	**130,422**	**98.0%**
Boondooma Dam	204, 200	204, 200	100.0%

Capacity and availability

The Operating Strategy has been developed based on the asset capacities provided by Grid Service Providers for the SEQ Water Grid Performance Standards, with amendment as required to be reflective of the current infrastructure. The capacity of the Water Grid, and of zones within it, is a function of the capacity and availability of individual assets. Capacity is measured by asset, based on one of the following metrics:

- extraction capacity (megalitres per day)
- treated water storage (megalitres)
- treatment production (megalitres per day)
- transfer capacity (megalitres per day).

Attachment 3 lists available operating modes by demand zone, based on this existing infrastructure. The preferred Operating Strategy for each sub-region is described in Section 5.5.

Minimum flows must be maintained in major pipelines in order to preserve water quality, as stated in Table 5. A range of other asset specific constraints are reflected in the Operating Strategy. For example:

- the Woorim Water Treatment Plant should not be used until capital upgrades are undertaken
- until further optimisation is completed, the Banksia Beach Water Treatment Plant cannot routinely operate at capacity.

Upcoming maintenance activities will be addressed as part of monthly Grid Instructions.

Table 5: Minimum transfer volumes

Pipeline	Minimum transfer volume (ML/ d (day)
Southern Regional Water Pipeline	Northerly flow 25 Southerly flow 20
Northern Pipeline Interconnnector	Southerly flow 20
Eastern Pipeline Interconnector	Easterly flow 4 Westerly flow 4

The SEQ Regional Water Balance Model provided by the Commission reflects water resource planning constraints.

Committed infrastructure

Committed regionally significant infrastructure projects will increase the available capacity within the timeframe of the Operating Strategy. Key commitments are:

- Hinze Dam upgrade (February 2010)
- Northern Pipeline Interconnector Stage 2, including installation of reverse flow capacity (end 2011)
- Wyaralong Dam (end 2011)
- Wyaralong Water Treatment Plant and associated pipelines (construction from 2014–15 and commissioning from 2015–16).

Continuing above average rainfall has delayed completion of the Hinze Dam upgrade, with the work now scheduled for completion during February 2011. While construction is continuing, in the case of an extreme rainfall event occurring on the Gold Coast, the Hinze Dam is now capable of storing water to and above the new Stage 3 full supply level.

5.0 Operating Strategy

5.1 Security

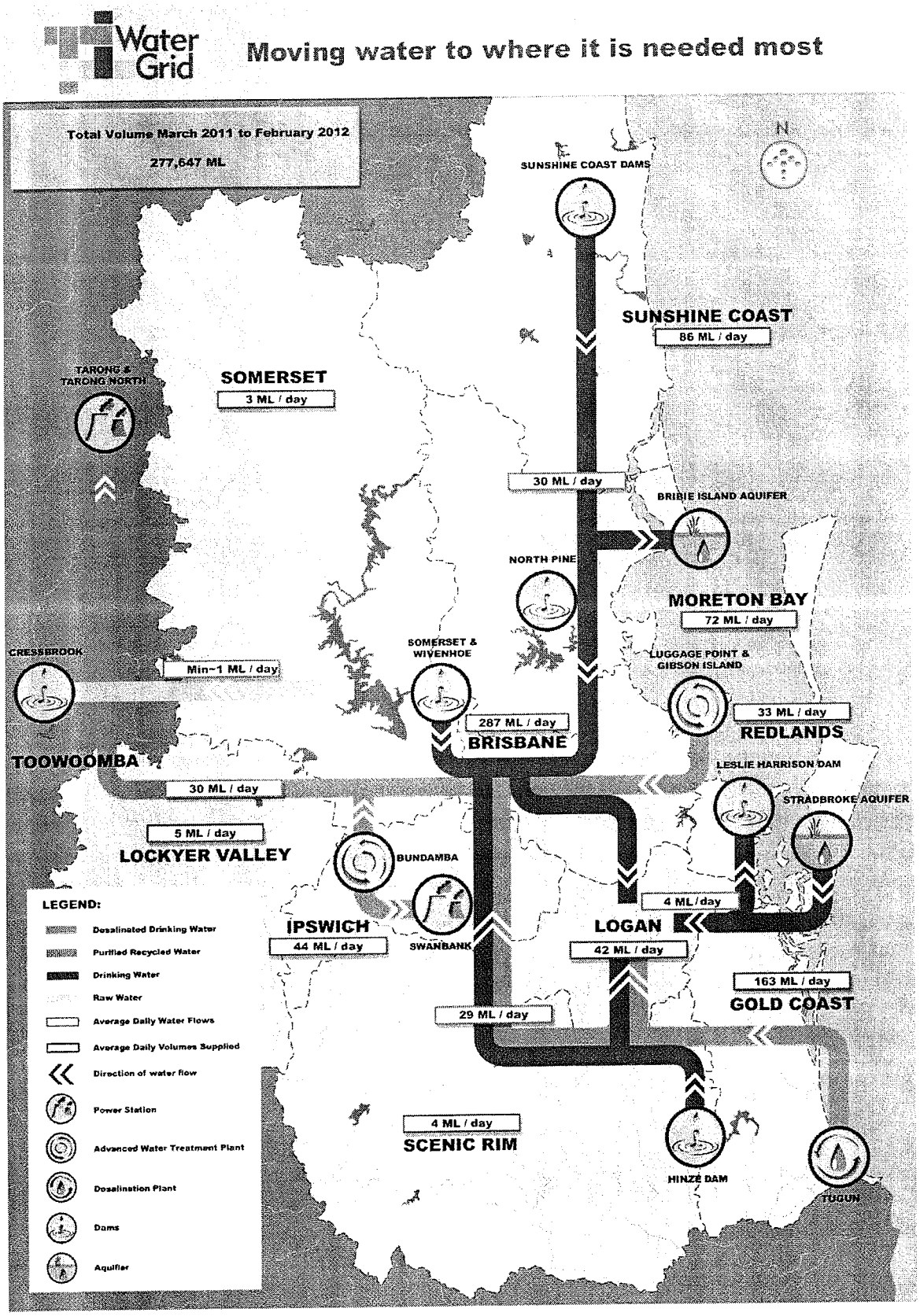
The key elements of the Operating Strategy over the next 12 months are:

- Transfer of approximately 30 megalitres per day from the Sunshine Coast to the Caboolture, Morayfield and Narangba areas via the Northern Pipeline Interconnector. Transfers will be reduced to the minimum flow requirements of about 20 megalitres per day if Sunshine Coast dams are at a level equal to or less than 70% or are less full than Wivenhoe, Somerset and North Pine dams. In these circumstances, the Narangba reservoir complex will be supplied from the North Pine water treatment plant.
- Transfer at minimum flow requirements from Redland to Logan via the Eastern Pipeline Interconnector. Subject to operational constraints, production from the Capalaba water treatment plant will be minimised, with up to 30 megalitres per day taken from North Stradbroke Island.
- Transfer of up to 110 megalitres per day from the Gold Coast to Brisbane and Logan via the Southern Regional Water Pipeline, while production from the Mt Crosby and North Pine water treatment plants is constrained due to high source water turbidity or other water quality issues. Transfers will be reduced to 25 to 30 megalitres per day once these constraints are overcome, maintaining minimum flow requirements and supplying a small volume to the area south of Greenbank.
- The Gold Coast Desalination Plant will operate at a minimum of one-third of capacity while production from the Mt Crosby and North Pine water treatment plants is constrained (approximately 44 megalitres per day). The Gold Coast Desalination plant will be operated in standby mode once these constraints are overcome. Production will be increased when needed to manage water quality or asset reliability issues elsewhere in the Water Grid.
- Operation of the Western Corridor Recycled Water Scheme to match demand and commissioning constraints (typically 35 megalitres per day). The Gibson Island Advanced Water Treatment Plant and one stage of the Bundamba Advanced Water Treatment Plant will be demobilised in mid 2011.

Key water security issues are described in more detail below, including the temporary draw down of Wivenhoe Dam and the operation of climate resilient supplies. Figure 9 illustrates the overall operation of the Water Grid based on typical demand, including the amount of water treated and used within each subregion and the transfers between them. The illustration reflects typical operation beyond the current constraints on production from the Mt Crosby and North Pine water treatment plants due to high source water turbidity.

Attachment 10 contains a detailed production and transfer forecast for the 2011–12 financial year, based on the low demand scenario. The forecast is intended to assist Grid Service Providers in the budgeting process for the 2011–12 financial year.

Figure 9: Key elements of the Operating Strategy



The Operating Strategy within each subregion and for key demand zones is described later in this section. Attachment 3 outlines options for supplying each demand zone in the Water Grid and key issues to be considered in making Grid Instructions. The attachment states the current or preferred option for supplying each demand zone, as part of the overall Operating Strategy for the coming 12 months.

Based on this Operating Strategy, the maximum and minimum capacity required of key assets is summarised for each entity in Attachments 4, 5 and 6. These attachments are a key output from the Operating Strategy. The capacity requirements reflect current availability, based on information previously provided by Grid Service Providers. These requirements will be refined in future versions of the Operating Strategy, in consultation with the providers. In the meantime, the Water Grid Manager will work with the Grid Service Provider to assess the need for any proposed changes to available capacity.

In time, as more information becomes available, the attachments will also state reliability required of each asset and potentially also additional water quality specifications to those contained in the Water Grid Quality Management Plan.

Draw down of key storages

On 13 February 2011, it was announced that, in order to temporarily increase the flood mitigation capacity of Wivenhoe Dam, the Dam was to be reduced to and held at 75% of its full supply level, until the end of the wet season on 31 March 2011. This decision took into account advice provided by Seqwater from a flood mitigation perspective and advice provided by the Water Grid Manager from a water security perspective.

For the Operating Strategy, water security has been assessed based on Wivenhoe Dam being at 75% of its Full Supply Level at the start of the simulation runs undertaken.

In relation to other storages, the Water Grid Manager has previously advised the Minister and Seqwater that it has no in-principle objection to North Pine Dam being drawn down to 97.5% of its full supply level. In doing so, the Water Grid Manager relied on advice from Seqwater that for a reduction of this size there may be some operational and community benefits in some circumstances. For the Operating Strategy, water security has been assessed based on North Pine Dam being at 97.5% of its Full Supply Level at the start of the simulation runs undertaken.

Operation of climate resilient supplies

The Gold Coast Desalination Plant and Western Corridor Recycled Water Scheme underpin water security for South East Queensland.

The *South East Queensland Water Strategy* highlights the importance of these supplies, explaining that the system yield would reduce from 545,000 megalitres per year to about 445,000 megalitres per year absent the capacity to introduce purified recycled water into Wivenhoe Dam when key Water Grid storages fall to 40% of combined capacity. This reduction would bring forward the time at which the next source of supply is required.

While critical to our long-term water security, these facilities do not need to be operated at capacity at all times.

For the Gold Coast Desalination Plant, the Operating Strategy is that:

- the facility be operated at capacity when key Water Grid storages are below 60% of combined capacity
- at other times, the facility be maintained and operated in standby mode, such that it is available at capacity within 24 to 72 hours of a request from the Water Grid Manager
- this facility will be called upon to produce at higher production volumes if a water quality or asset related issue require additional supply volume to meet demand or mitigate relevant water supply risks

This operating mode will be reviewed in 2012–13, taking into account security and demand at that time and prior to the purchase of new membranes.

Production from Gold Coast Desalination Plant will be reduced once the plant is no longer required to be operated at higher levels due to production from the Mt Crosby and North Pine water treatment plants being constrained due to high source water turbidity over the 2010/11 summer. If this type of issue was to occur again over the life of this Operating Strategy production from the Gold Coast Desalination Plant would be increased again.

The key advantage of this operating mode is that the Gold Coast Desalination Plant can rapidly deliver water to the Water Grid as required, in response to water quality incidents or key assets being unavailable due to planned maintenance or asset failure.

For the Western Corridor Recycled Water Scheme, the recommended Operating Strategy is that:

- purified recycled water production be matched to demand, subject to operational constraints
- purified recycled water be supplied from the Luggage Point Advanced Water Treatment Plant and one stage of the Bundamba Advanced Water Treatment Plant
- the Gibson Island Advanced Water Treatment Plant and one stage of the Bundamba Advanced Water Treatment Plant be de-mobilised.

This operating mode will be reviewed in 2012–13, taking into account demand for purified recycled water at that time and prior to the purchase of new membranes.

The Gibson Island Advanced Water Treatment Plant and one stage of the Bundamba Advanced Water Treatment Plant will be demobilised by end June 2011, subject to operational and contractual requirements. This timeframe provides an opportunity for WaterSecure to develop and implement detailed demobilisation and maintenance plans.

Trigger to re-mobilise assets

The Operating Strategy reflects that, from current storage levels, the critical risk criteria in the System Operating Plan is that all reasonable actions be taken to maintain the probability of key Water Grid storages reaching 40% of combined capacity at less than 5%. Water needs to be managed across the region in a way that minimises the risk of dams falling to 40% of capacity. This would be achieved by modifying the system operation prior to reaching 40% of capacity, such as by:

- operating the Desalination Plant at capacity from when key Water Grid storages fall to 60% of combined capacity
- maximising production other climate resilient sources, such as the North Stradbroke Island Borefield
- transferring water from parts of the region where storages are highest to parts where they are least (just as occurred during the recent drought)
- increasing the take of water from dams that are most likely to receive inflows, within water resource planning limits.

In addition, this version of the Operating Strategy specifies that, based on stochastic modelling of draw down probabilities and assessment of appropriate early response trigger levels, local water treatment plants that are not required over the next five years will be re-mobilised when key Water Grid storages fall to 45% of capacity.

The probability of re-mobilising the local water treatment plants, and incurring associated capital costs, will be minimised by commencing supply from the Desalination Plant when key Water Grid storages reach 60% of combined storage capacity. Preliminary analysis indicates that this arrangement reduces the probability weighted cost of the overall portfolio. In effect, the early operation of the Desalination Plant is an insurance policy, incurring realised operational expenditure as a means of avoiding potential capital expenditure. More specifically, we consider that:

- the increase in the probability weighted cost of operating the Desalination Plant at capacity (both earlier and for longer) is less than
- the reduction in the probability weighted costs of recommissioning the local facilities (including both the probability that recommissioning can be avoided through inflows and ongoing return of and on capital, once expended).

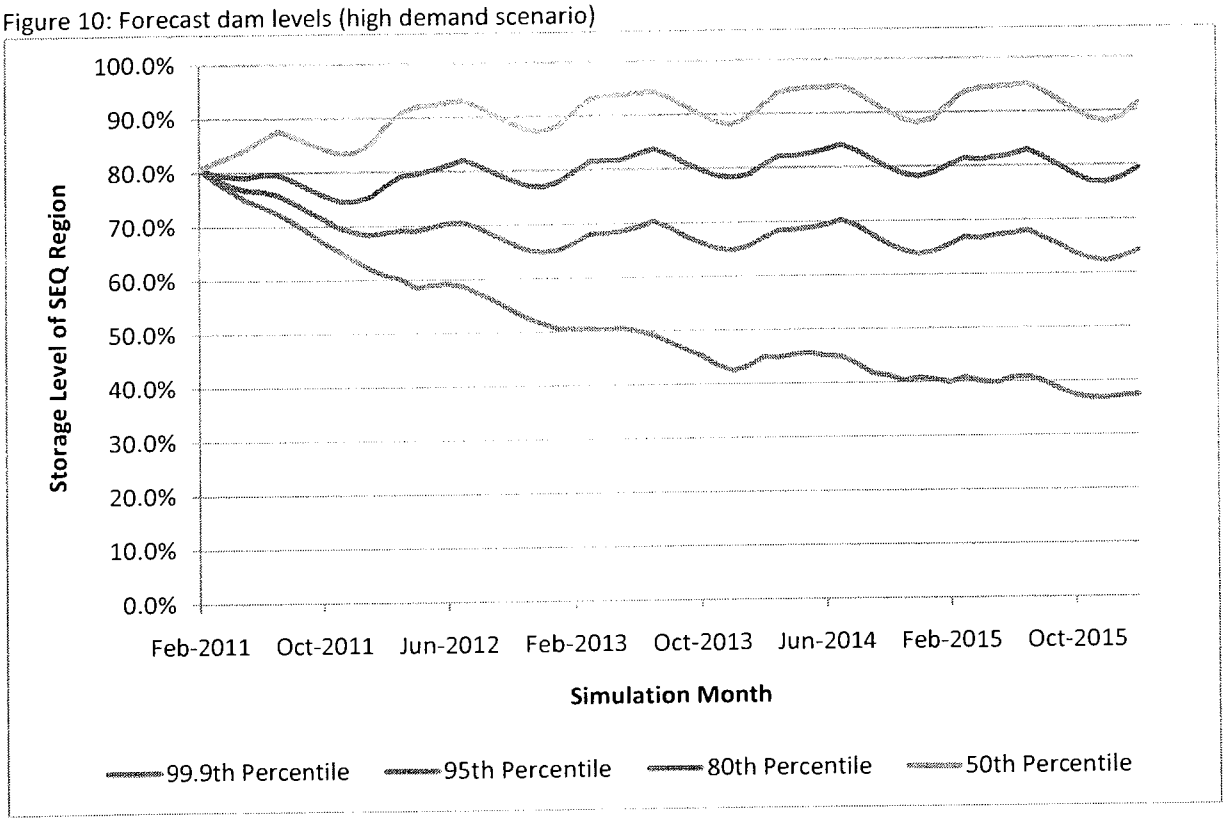
The trigger to recommence supply from the Desalination Plant may be further increased, should significant other water treatment plants be de-mobilised.

Security assessment

Figure 10 forecasts the combined level of key Water Grid storages, based on this Operating Strategy, the high demand scenario and various levels of inflows. It illustrates that, based on the Operating Strategy and the high demand forecast, there is:

- approximately 80% probability that storages will remain above 80% of capacity over the next five years
- about 1 to 2% probability of storages falling to 60% of capacity within the next five years, triggering the operation of the Desalination Plant at full capacity at all times
- less than 0.1% probability of storages falling to 40 % of capacity within the next five years, triggering the use of purified recycled water to augment Wivenhoe Dam and the reintroduction of Medium Level Restrictions.

Figure 10: Forecast dam levels (high demand scenario)



In addition to the information provided above that relates to regional storage volumes, information is presented below related to the key subregional storages across South East Queensland. Based on this Operating Strategy proposed and the high demand scenario the following graphs and probability statistics relate to the northern, eastern and southern subregions:

- for northern South East Queensland – Baroon Pocket Dam is full, with the probability of it remaining above 70% of capacity in the next five years greater than 75%
- for eastern South East Queensland – Leslie Harrison Dam is full, with the probability of it remaining above 80% of capacity in the next five years greater than 85%
- for southern South East Queensland – Hinze and Little Nerang dams are full with the probability of them remaining above 70% of capacity in the next 5 years greater than 80%.

Figure 11: Forecast levels of Baroon Pocket Dam (high demand scenario)

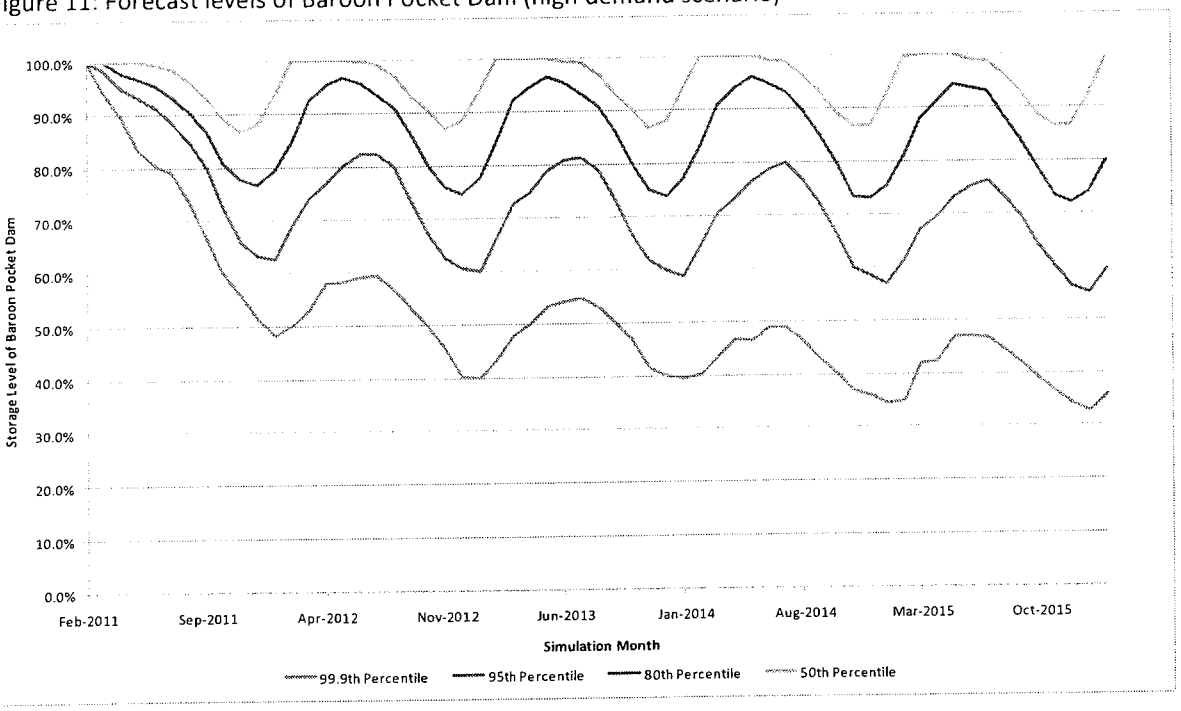


Figure 12: Forecast levels of Leslie Harrison Dam (high demand scenario)

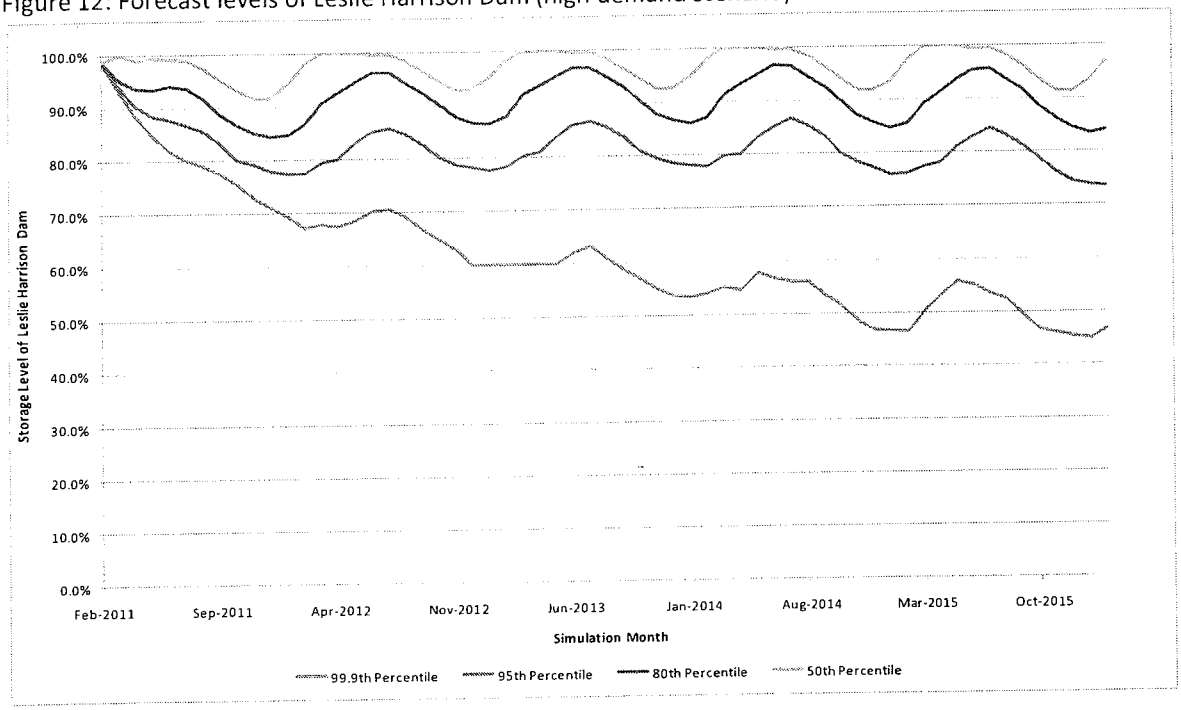
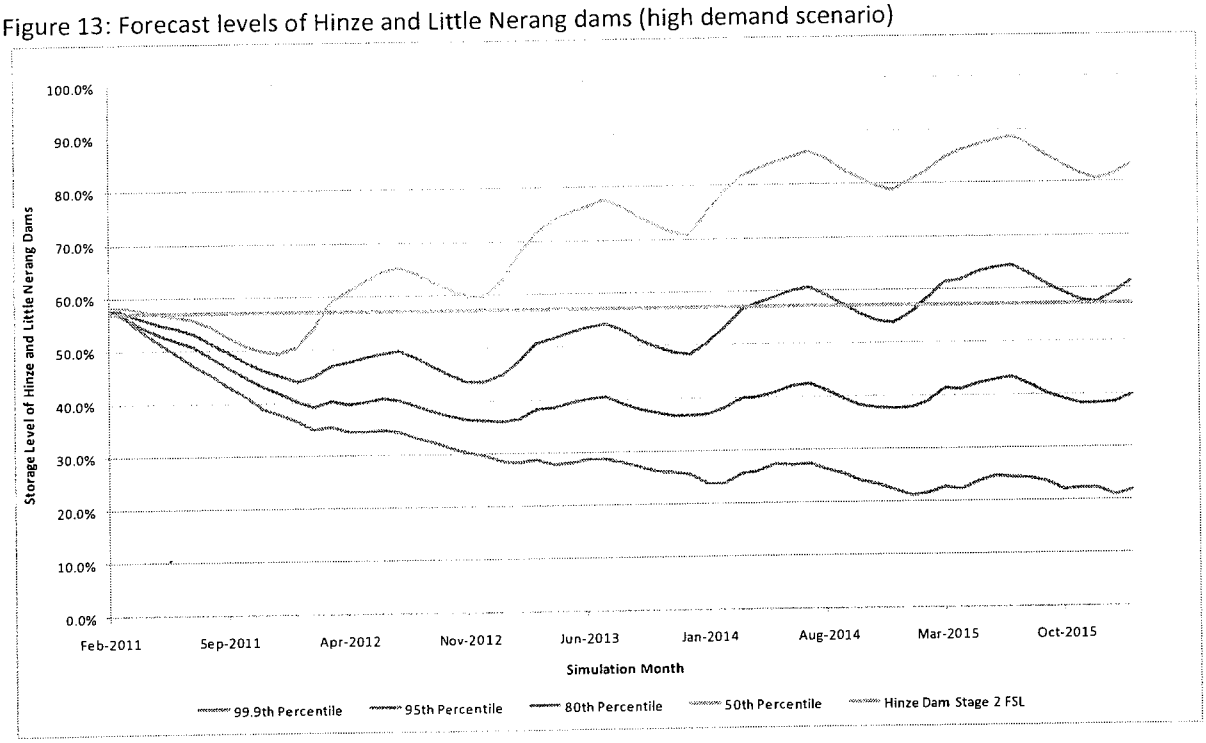


Figure 13: Forecast levels of Hinze and Little Nerang dams (high demand scenario)



For these water security assessments, the water supply component of Hinze Dam Stage 3 is assumed to be available from December 2011 to allow time for the raising to be complete and water allocation granted to the Water Grid Manager through the resource operation planning process.

Wyaralong Dam filled during January 2011. For water security assessments, it is assumed to commence supply in 2015–16. The water treatment plant and connecting pipeline are scheduled to be commissioned from that time (refer below). Storage level is from 21 February 2011.

5.2 Cost

Short-run variable costs

Based on the Operating Strategy, the short run variable costs of operating Water Grid over the next year is estimated at about between $3 million and $4 million per month, depending upon demand. This estimate includes energy and chemicals for water treatment plants, as listed in Table 6. They do not include staffing or administrative costs, or the return on and of capital. These estimates are expected to be refined as an input to economic regulation by the Queensland Competition Authority, including by determining whether costs vary at different levels of production.

Table 6: Short-run variable operating costs of existing water treatment plants (2010–11)

Source	Short-run variable operating cost ($/ML)
Landers Shute Water Treatment Plant (WTP)	$61.74
Noosa WTP	$112.75
Molendinar WTP	$72.20
Mudgeeraba WTP	$88.78
North Pine WTP	$121.21
Mt Crosby Eastbank & Westbank WTPs	$95.40
Smaller plants	$178.24

Source: Based on 2010–2011 Ministerial determination for the purchase of services by the Water Grid Manager.

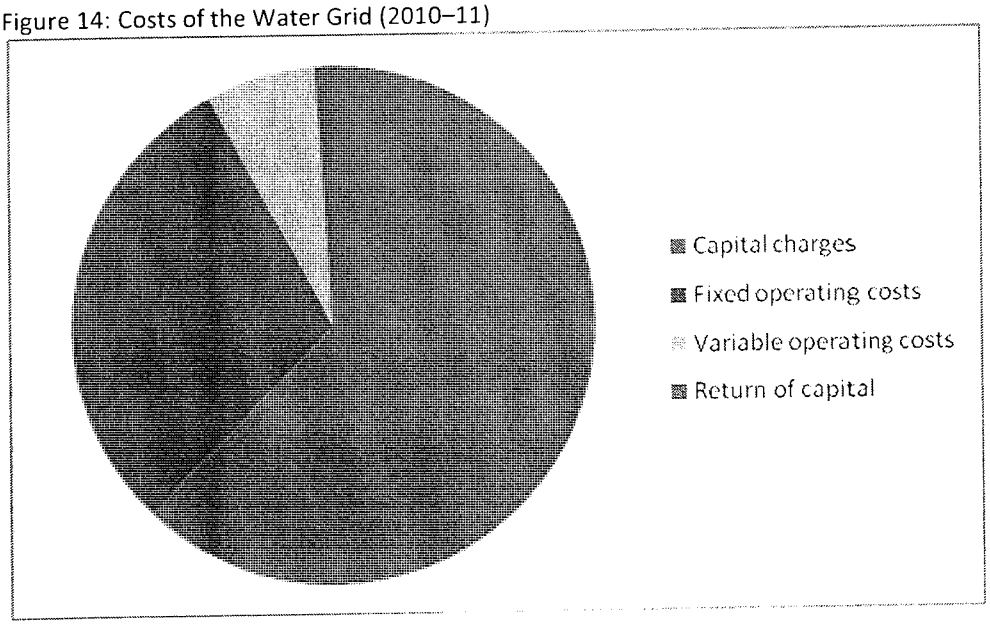
In this version of the Operating Strategy, short-run variable operating costs have been optimised by:

- Minimising production from climate resilient sources. For example, the Desalination Plant will be operated in standby mode when not required in response to water quality incidents or key assets being unavailable due to planned maintenance or asset failure. This represents a saving of about $650,000 per month, compared to operation at a consistent production of 33% of full capacity.
- Minimising transfers between subregions, subject to minimum flow requirements. For example, transfers through the Southern Regional Water Pipeline will generally be maintained at approximately 25 – 30 megalitres per day, when the Desalination Plant is operating. This represents a saving of about $120,000 per month, compared to operation at capacity (based on a variable cost of $55/ML).
- Minimising production at relatively expensive water treatment plants, subject to operational constraints. For example, water will be supplied to the Morayfield and Caboolture areas via the Northern Pipeline Interconnector from the Landers Shute Water Treatment Plant ($72/ML) in preference to operating the Caboolture Water Treatment Plant ($135/ML). This represents a saving of up to $15,000 per month.

Other costs

Short-run variable costs represent a relatively small proportion of the overall costs of the Water Grid, as illustrated in Figure 14. More significant savings can be achieved by reducing or avoiding fixed operating costs (30 % of total costs) and capital costs (62%).

Figure 14: Costs of the Water Grid (2010–11)



In particular, given the current level of water security, we will use the Operating Strategy to avoid and defer capital expenditure whenever possible. Over time it is envisaged to incorporate other costs that reflect all relevant costs to ensure a best cost outcome for the Water Grid as a whole. This is the objective that will be sought in future decisions about asset utilisation as information on the full range of costs across the various organisations become available.

This version of the Operating Strategy avoids fixed operating and capital costs by specifying that some water treatment plants are not required over the next five years, enabling them to be placed in standby mode or demobilised. It specifies that, at least over the next five years, the:

- Woorim Water Treatment Plant is not required, avoiding the need for extensive capital expenditure
- Maleny Water Treatment Plant is not required once the pipeline from the Landers Shute Water Treatment Plant is commissioned, avoiding fixed operating costs and the need for extensive capital upgrades
- Brisbane Aquifer Project is not required, subject to operational requirements, avoiding fixed operating costs and asset renewals costs.

To compensate, supply will be increased from larger, more efficient water treatment plants. For example, the Mt Crosby Water Treatment Plant can supply water to Brisbane at about 18% of the short run variable cost of the Brisbane Aquifer Project, and without any additional staff or maintenance costs.

We are investigating the future operational and operating costs of other smaller and aged water treatment plants to understand the implications of closure and availability of alternate sources (refer Section 6). These investigations will be undertaken in partnership with the relevant Grid Service Providers. Once investigated, they will be assessed as a portfolio, taking into account option value. The portfolio will include a combination of:

- base supplies
- peaking supplies, which will ensure that sufficient capacity is available during peak demand periods and when large base supplies are unavailable due to maintenance or asset failure
- standby supplies, which can be re-mobilised within a short period
- demobilised or demolished supplies, which will be re-mobilised at predetermined triggers and usually involving capital expenditure.

Base supplies will include:

- large water treatment plants taking water from large storages, including Landers Shute, North Pine, Mt Crosby and Molendinar water treatment plants
- water treatment plants connected to the wider part of the Water Grid that also have dedicated supply zones that cannot be readily supplied from another source including the Mudgeeraba Water Treatment Plant
- water treatment plants that supply areas that are not connected to the Water Grid, such as at Esk and Dayboro. Because they are not connected, these supplies must also have the capacity to meet peak demands, and must be reliable.

Given current and forecasts demands, these facilities will generally be operated below capacity, meaning that they may also provide peaking capacity. This increases the scope for small and aged water treatment plants to be used as standby supplies or demobilised, subject to other considerations.

5.3 Water quality

The Operating Strategy is aligned with the Water Grid Quality Management Plan.

The version of the Water Grid Quality Management Plan that was submitted to the Commission in November 2010 included the SEQ Water Grid Quality Monitoring Plan (Water Grid Quality Monitoring Plan) for the first time. This version was developed in collaboration with representatives from other Grid Participants via a technical working group facilitated by the Water Grid Manager. The Water Grid Quality Monitoring Plan identifies approximately 60 Key Interface Points that have been selected to describe the quality of water being supplied from the Water Grid. Future editions of the Water Grid Quality Monitoring Plan will specify a minimum verification monitoring program for each of these points, with verification testing to be undertaken by the relevant entity as part of routine monitoring. In doing so, it will provide a practical and cost efficient mechanism for the routine and periodic reporting of water quality to inform whole-of-Grid decision making. The draft Key Interface Points are shown in Attachment 2.

Future versions of the Water Grid Quality Management Plan will also include:

- A Grid Risk Assessment, which will summarise water quality risks by asset and evaluate risks associated with each available operating mode within a supply zone.
- A Grid Improvement Plan, which will provide a prioritised list of actions to improve water quality across the Water Grid. The risk assessment will focus on acute health risks over chronic health and aesthetic risks. The improvement plant may constrain the Operating Strategy, such as through an action to not operate an aged water treatment plant until capital improvements are undertaken.

The Grid Improvement Plan is likely to include a range of actions (primarily investigations), some of which may impact upon how the Water Grid is operated. For example, having the Gold Coast Desalination Plant available allows water to be taken from other sources should specified triggers be exceeded. It also provides time for detailed investigation of any residual high or extreme level water quality risks in southern and central South East Queensland and for improvements to be implemented prior to end 2012–13.

Detailed investigations

A number of detailed water quality investigations are underway led by the Water Grid Manager and involving other relevant Grid Participants, as summarised below.

Redland

THMs have been detected in the bulk and distribution network in the Redland area at concentration levels approaching, and in some cases exceeding, the guideline value specified in the *Australian Drinking Water Guidelines 2004*. There are a number of contributing factors including the characteristics of water treated at Capalaba Water Treatment Plant and the retention time in the water supply network. To reduce the production of THMs, supply from the Capalaba Water Treatment Plant is generally minimised.

The Capalaba Water Treatment Plant is one of the several supplies to the Redland area. To determine the optimal supply arrangement, the Water Grid Manager has commenced, a detailed investigation to collate water quality monitoring by all entities and to determine the cause and timing of THM spikes and high base levels. The investigation will collate information regarding the various trials that have been undertaken to minimise THM production, through modifications of to the production and delivery of the water. It will also offer short and long term solutions to minimise THM production. In the mean time water from North Stradbroke Island is being mixed with water from Capalaba it minimise THM levels in the general reticulation area of Redland.

South Maclean

For most of the last 12 months, water has been supplied from the South Maclean Water Treatment Plant to the areas south of it. However, the Water Treatment Plant has been shut down due to episodes of poor raw water quality in the Logan River. The most recent shutdown commenced on 27 December 2010. During these shutdowns, areas south of the Water Treatment Plant are supplied from the Southern Regional Water Pipeline via distribution infrastructure at the Teviot Road off-take. This transfer involves a switch of disinfection from chlorination to chloramination, with periods of low or no disinfection during the transfer and operational implications.

The Water Grid Manager is leading a detailed investigation to assess the optimal supply arrangement to supply the area south of South Maclean Water Treatment Plant in partnership with Seqwater and Allconnex. The supply arrangement will apply prior to a larger scale decision being made on the subregional planning direction for the area, which is being coordinated by the Commission. Maintenance of disinfection residual and system reliability are key drivers for the investigation.

Free chlorine dosing of chloramine system

Loss of chloramine residual appears to be a regular occurrence each summer and occurs quite rapidly, usually at the extremities of the reticulation systems and associated reservoirs. More recently, it has also been observed in the bulk transport system, most likely a result of nitrification.

Options to manage nitrification across Water Grid participants are being reviewed and led by LinkWater and involving all Grid Participants. In the past, disinfection has been switched from chloramination to chlorination for a period to remove the nitrifiers, a group of microorganisms responsible for nitrification and implicated with chloramines loss. This has also been done routinely overseas. If agreed to be feasible and beneficial, this approach could be implemented in late September or early October this year.

Summer Risk Assessment

For the remainder of this and the next summer period, the main risks to supply from the Water Grid are associated with water quality. The warmer weather and the increased likelihood of high rainfall events can increase a range of risks to water quality, from increased rates of chlorine decay to increased pressure on filtration processes from increased turbidity or algal content. The Operating Strategy has been prepared taking account of these risks, based on the proposed Water Grid Quality Management Plan and the draft Grid Participant risk assessments. More specifically, the summer risk assessment highlighted the following potential events:

- taste and odour events caused by blooms of algae, cyanobacteria and actinomycetes
- total dissolved solids/electrical conductivity events
- manganese events
- decreased disinfection residual through biological and chemical decay in the warmer months, exacerbated by low usage during wet weather events.

Operational responses have been developed to respond to these risks.

Disinfection by-product risks

The Grid Monitoring Plan specifies target minimum and maximum disinfectant residual concentrations for each key interface point and each mode of operation. These levels are to be set in consultation with water quality officers, and are intended to initially reflect how the Water Grid currently operates. The Grid Monitoring Plan will also set water quality values for other parameters.

While maintaining the specified levels of disinfection residual, we are mindful of operating the Water Grid so as to minimise the generation of disinfection by-products. The Operating Strategy was developed considering the potential risk from breakpoint chlorination contributing to disinfection by-products formation. For example, by generally operating:

- the Southern Regional Water Pipeline in a northerly direction
- the Eastern Pipeline Interconnector in a westerly direction.

Figure 15 illustrates the disinfection process used in parts of the Water Grid, showing current and theoretical flow directions of major pipelines, where bulk water must be converted from one disinfection method to another. As a priority, investigations are being undertaken into the preferred disinfection process and specific issues, such as chlorate generation.

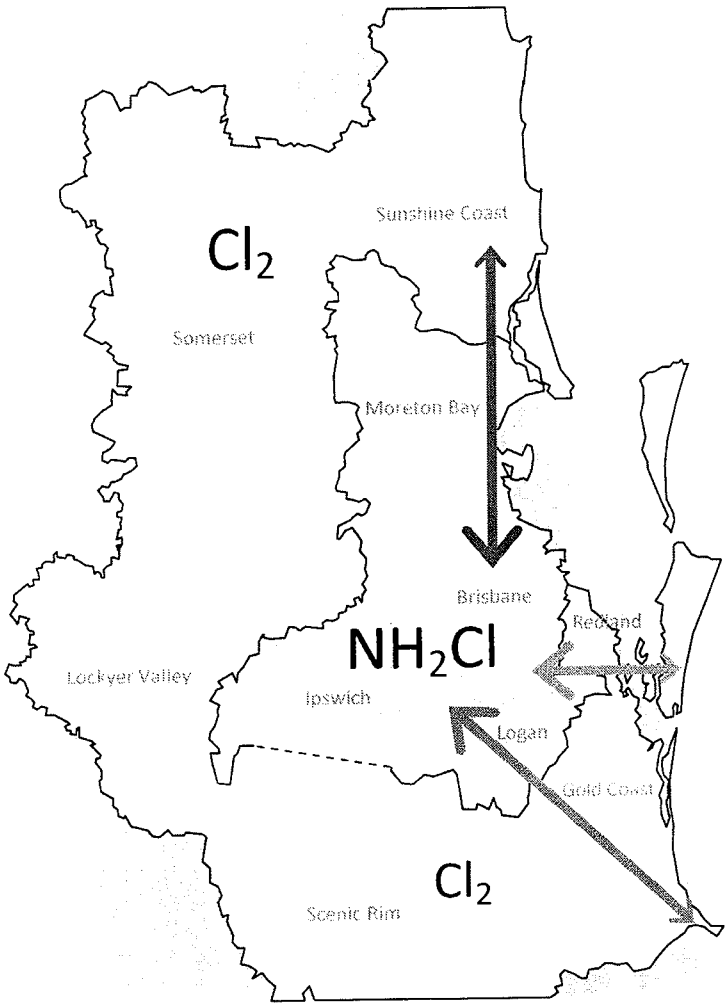
Whole-of-Grid Disinfection options study

This study is part of a long term water quality strategy. It has been commissioned by the Water Grid Manager to gather all relevant information about the current status, and make recommendations as to future disinfection options for the whole, or segments of, the Water Grid.

An investigation into disinfection options for the Water Grid is warranted because the current arrangements may not be the most appropriate, and may also pose unnecessary and unintended risks and costs. The aim of this investigation is to assess and quantify the deficiencies, risks, and costs of the current disinfection arrangements, and to evaluate whether alternative arrangements would be preferable.

Beyond these requirements, due to water quality risks the Operating Strategy states that water will not be required from the Woorim Water Treatment Plant until capital upgrades are undertaken.

Figure 15: Disinfection processes



Legend

—	Northern Pipeline Interconnector
—	Eastern Pipeline Interconnector
—	Southern Regional Water Pipeline
	Chloraminated water supply zone
	Chlorinated water supply zone
	Approximate disinfection regime boundary
↘ big arrow	Direction of flow since Water Grid establishment
↖ small arrow	Direction of theoretical reverse flow

Other chronic health and aesthetic risks

The Operating Strategy includes a range of actions to address chronic health and aesthetic issues through the operation of the Water Grid. Specifically, the Operating Strategy seeks to isolate, blend or transfer water from impacted sources by using the major interconnections and the excess treatment capacity that is currently available.

Aesthetic water quality issues are often related to physical and chemical changes, such as algal blooms and turbid raw water. These changes can be managed by not taking water from an affected source or by blending it with water from a desalination plant or another source. Aesthetic related issues are also managed by minimising changes to the source of water to an area, thereby minimising taste changes.

A range of asset specific issues have also been taken into account, as outlined in Section 5.5. For example, due to historic water quality issues, production from the Capalaba Water Treatment Plant will be minimised and regular monitoring undertaken.

Managing water quality by blending

Geosmin and 2-methylisoborneol (MIB) are compounds created during the lifecycle of microorganisms commonly found in environmental water. While not a health hazard, the presence of these compounds can affect the taste and odour of water.

The Mt Crosby Weir has been affected by both geosmin and MIB in recent years. From December 2008 through January 2009, it received water with significant levels of geosmin, and from December 2009 through April 2010, it received water with significant levels of MIB.

During these two events, the Water Grid Manager decreased the supply output of the Mt Crosby Water Treatment Plants, and imported drinking water from the Gold Coast through the Southern Regional Water Pipeline. The drinking water from Gold Coast was blended with that of Mt Crosby, lessening the overall concentrations of geosmin and MIB supplied to the central-SEQ region respectively.

Without use of the drinking water supplied by the Gold Coast Desalination Plant and the Molendinar Water Treatment Plant, the levels of MIB present at consumers tap would have closely mimicked that of the Mt Crosby Water Treatment Plant. This means the peak concentration experienced by consumers would have been double what was actually experienced by consumers, and the average experienced by consumers from March 2010 to May 2010 would have been one-third greater.

5.4 Reliability

South East Queensland has a relatively high level of system reliability at present, due to:

- the amount of excess water treatment capacity available
- the construction of major interconnections, enabling most demand zones to be supplied from multiples water treatment plants
- reduced extent and persistence of peak demands.

This version of the Operating Strategy seeks to maintain system reliability by requiring that the major interconnecting pipelines be available to operate at capacity within hours of an incident occurring. These pipelines provide the capacity to isolate, blend or transfer water following asset failure, just as they do for water quality incidents. The metrics defining this performance will be developed over time in consultation with the Grid Service providers.

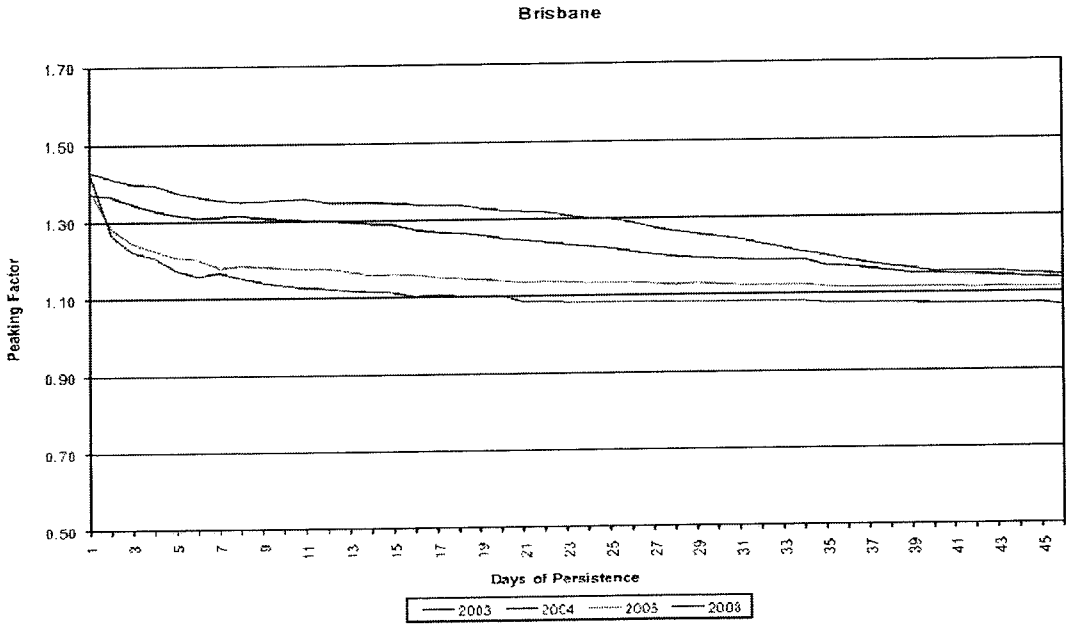
In future versions of the Operating Strategy, Attachments 4, 5 and 6 will specify the reliability required by asset, based on a whole of system analysis. Some of these specifications may necessitate capital expenditure.

An investigation into system reliability is commencing in 2011. This investigation will concentrate on treatment and distribution assets with the aim of being able to deliver water to the end consumer at a reasonable standard. Delivery standards will be defined for key critical assets upstream of consumers to achieve overall reliability requirements. Reliability improvements will be attained by understanding the interrelationships of these key assets along the supply chain to achieve an operating methodology that minimises supply risks and where there may be an unacceptable risk augmentation requirements will be investigated and the standards re-tested.

Peak demand and system reliability

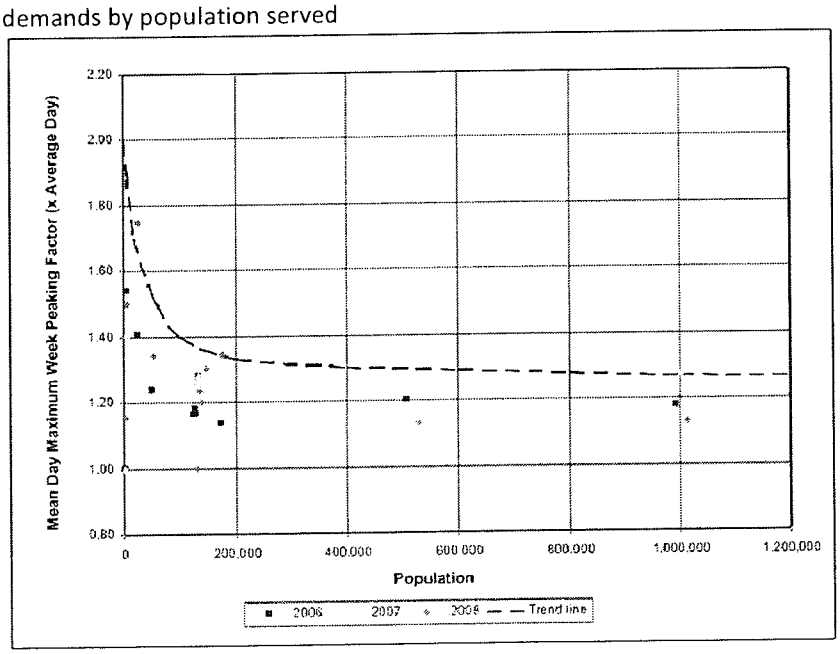
Peaking demands are primarily influenced by garden watering. As illustrated in **Figure 17**, peak demands and the duration of peak periods has reduced in the Brisbane area between 2003 and 2008. Similar reductions have been achieved in other areas. With reduced peak demands, the same volume of emergency storage will last for a longer period of time, thereby increasing system reliability.

Figure 16: Extent and persistence of peak demands in the Brisbane area



Peaking factors also reduce as the contributing population increases, as shown in Figure 17. With the construction of the Water Grid, many areas are connected to the same supply system, reducing the requirement for emergency storage.

Figure 17: Peak demands by population served



5.5 Key elements by subregion

Key aspects of the Operating Strategy are described below, by subregion and demand zone.

Northern South East Queensland

- Supply to the southern part of the Sunshine Coast will continue to be from the three local sources, being the Landers Shute, Image Flat and Ewen Maddock water treatment plants. The costs associated with producing water at the Image Flat and Landers Shute water treatment plants are comparable, and lower than for the Ewen Maddock Water Treatment Plant.
- The Ewen Maddock Water Treatment Plant will be operated at a low production rate until approximately early April 2011, when defects rectification period under the construction agreement ends. From this point Ewen Maddock will continue to be utilised at low production rates and will generally only be utilised at higher rates of production:
  - when the Landers Shute Water Treatment Plant is unavailable or its output is limited, including as a result of poor raw water quality
  - to enable increased transfers from the Landers Shute Water Treatment Plant south, via the Northern Pipeline Interconnector.
- In some instances this operating mode provides flexibility to increase production at the Landers Shute Water Treatment Plant, for transfer south via the Northern Pipeline Interconnector.
- Over the remainder of this summer and next summer, the main risk to this area relates to water quality. In particular, the growth of blue green algae in Baroon Pocket Dam can affect the capacity of the Landers Shute Water Treatment Plant. Increased algae content results in increased pressure on filtration leading to increased frequency of backwashing cycles. This decreases the time available to produce treated water for supply to Unitywater.
- Commissioning and reliability testing of Stage 2 of the Northern Pipeline Interconnector scheduled during the 2011 – 12 financial year to ensure the operability of the pipeline. The reliability trials will require operation of the newly constructed pipeline in a variety of directions and flow rates. Some of these requirements that may not be contemplated by the System Operating Plan. These activities will be facilitated though interagency coordination and Grid Instructions as required. A future version of the Operating Strategy will outline the preferred operating arrangements for the Northern South East Queensland sub-region once Stage 2 of the Northern Pipeline Interconnector is commissioned.

Noosa demand zone

- The System Operating Plan requires the Water Grid Manager to utilise the raw water sources available for use at Noosa Water Treatment Plant in accordance with a particular order of preference. This order of preference which requires the use of Lake MacDonald as first preference when the dam is above 95% of capacity. The frequency of Lake MacDonald overtopping over the last 8 to 10 months has resulted in a high level of use.

- In the current Operating Strategy this use of Lake MacDonald will be balanced with the water supplied from Mary Valley Water Supply Scheme, due to the capacity constraint of the raw water pipe from the Mary Valley. That is, the capacity of the Mary Valley pipeline is, under most demand scenarios, insufficient to meet the full requirements of Noosa. There is also frequently water quality issues associated with the water from the Mary Valley Water Supply Scheme in terms of increased treatment effort required.
- Depending upon demand, between 5 and 15 megalitres per day will need to be accessed from the Mary Valley Water Supply Scheme regardless of the level in Lake MacDonald to ensure demand can continue to be met, the Lake MacDonald water entitlement is not breached and water quality in the Mary River pipeline is maintained at a suitable level.

Maleny demand zone

- Once the pipeline from the Landers Shute Water Treatment Plant is proven reliable and free from defects, no water will be required from the existing Maleny Water Treatment Plant within the timeframe of this Operating Strategy.
- The variable operating cost of treating water at the Landers Shute Water Treatment Plant and transporting it to the town of Maleny is less than the cost of variable operating cost of the Maleny Water Treatment Plant. High water quality risks are also avoided.
- Options for the future management of the Maleny Water Treatment Plant are being assessed in partnership with relevant stakeholders. Investigations have highlighted that capital expenditure could be avoided, given that the allocation from the weir not be required over the next five years.

Moreton Bay demand zones

- The Caboolture, Morayfield and Narangba areas will generally be supplied from the Sunshine Coast via the Northern Pipeline Interconnector Stage 1. This arrangement is lower cost than supply from local sources, with superior taste and odour and lower risk of water quality incidents.
- The local Caboolture and Banksia Beach water treatment plants will contribute as needed, albeit at low production amounts due to cost and start-up requirements. For example, the Caboolture Water Treatment Plant will be kept available to provide supply should the regular summer algal growth in Baroon Pocket Dam affect Landers Shute Water Treatment Plant's alibility to produce sufficient volumes to supply the areas of Caboolture and Morayfield via the Northern Pipeline Interconnector.
- In general, other supply options will be used in preference to the Caboolture Water Treatment Plant, due to costs and water quality risks associated with development in the catchment of the Caboolture River. In addition, the contribution from Caboolture Water Treatment Plant is subject to the raw water quality being of a suitable standard. For example, once turbidity exceeds a set trigger level in the Caboolture River the production of treated water from that plant ceases.
- Subject to these operational constraints, the North Pine and Caboolture water treatment plants will supply the Narangba and Morayfield areas, should the combined level of Sunshine Coast storages be less than 70% or lower than the combined storage level of Wivenhoe, Somerset and North Pine dams (as a percentage of the total storage volume).

Bribie Island demand zone

- No water will be required from the Woorim Water Treatment Plant for at least 5 years. As noted in Section 4.3, significant capital expenditure is required in order to maintain drinking water treatment capacity at this location. This expenditure is not needed at this time, due to the negligible impact of this source upon regional water security and the presence of two other existing sources to supply Bribie Island.

Dayboro demand zone

- The summer risk assessment has identified a high risk of needing to cease supply from the Dayboro Water Treatment Plant due to flooding events resulting in potentially poor raw water quality effecting treated water quality. Carting is available as a temporary supply measure.

Central South East Queensland

- The majority of Central South East Queensland will be supplied from the Mt Crosby and North Pine water treatment plants as a base mode of operation over the life of this Operating Strategy.

Short Term Flood Impacts

- Recent significant rainfall and flood events over the 2010 – 11 summer across South East Queensland have impacted the operation and performance of many of the components of the Water Grid. While the emergency has been de-escalated, there remain a range of ongoing operational issues and constraints. These issues are expected to persist for some time to come and will be managed as part of the normal operation of the Water Grid. The issues and considerations are in addition to normal operational considerations, including management of water quality incidents and the risk of algal blooms in key storages.
- In particular, sediment and organic content in raw water has increased significantly, particularly in the Brisbane River. Early indications are that these conditions are likely to persist until the end of the wet season and beyond for some months, with the dams potentially taking up to a year to return to normal conditions.
- Due to poor raw water quality, chemical dosing requirements have increased along with the quantities of water treatment residues which need to be thickened and disposed. The greatest impacts are at the Mt Crosby and North Pine water treatment plants. At Mt Crosby, about 10 times more water treatment residue is being produced than is normal.
- Due to these issues, the Water Grid is currently being operated to reduce production requirements from the Mt Crosby and North Pine water treatment plants – with increased volumes being transferred into central South East Queensland. This will continue until turbidity levels return to levels that can be managed within the constraints of the solids handling processes of the relevant water treatment plants.
- As a result, the Gold Coast Desalination Plant continues to be operated at a minimum of one-third of capacity. This production together with increased production from Molendinar Water Treatment Plant allows up to about 90 to 95 megalitres per day to be transferred to central South East Queensland, while also meeting slightly increased demands on the Gold Coast.

- In future instances where raw water quality is impacted, the response will be similar. This operational decision has been incorporated in this Operating Strategy and the hydrologic modelling undertaken to test compliance with the risk criteria included in the System Operating Plan.

The Gap demand zone

- The Gap area can suffer from low chlorine residuals, particularly in summer when supplied from the Mt Crosby/Green Hill system. This was traditionally managed by supplying the Gap Reservoir from the Enoggera Water Treatment Plant.
- The Enoggera Water Treatment Plant has recently been upgraded, with a chloramination disinfection system installed. The Water Grid Manager has been working with Queensland Urban Utilities and Seqwater to test disinfection residuals and nitrification in the water supplied to the Gap under the two supply options. Preliminary data to date proves inconclusive in terms of definitively answering whether Enoggera Water Treatment Plant provides improved chlorine residual and free ammonia level in the Gap area. Data on disinfection residuals and the resulting compounds of nitrification when using the two sources will be further analysed to determine the preferred supply option in consultation with Seqwater and Queensland Urban Utilities including seasonal operation options. Until this point it is not envisaged that water will be required from Enoggera Water Treatment Plant other than potentially some production over winter months to continue undertaking the investigation into this area.

Other

- No supply is required from the Brisbane Aquifer Project within the timeframe of this Operating Strategy, and for at least five years. Supply from these assets ceased in September 2010, due to the high cost of operation relative to the Mt Crosby Water Treatment Plant. The Water Grid Manager and Seqwater are investigating the optimal operating mode over the next five years, including suitable plans and processes to enable remobilisation. Preliminary advice is that operation of one plant may be cost efficient, while also ensuring that Seqwater maintains the skills and knowledge required to operate all of the facilities.
- Significant critical maintenance work is occurring over the period of this Operating Strategy at the Aspley Reservoir. This operation will constrain the operation of the key bulk water assets in this area, particularly the volumes able to be provided from the North Pine clear water pumps. During this period, the bulk water assets will be operated to minimise the risk to water supply and water quality by having the Mt Crosby Water Treatment Plants and Landers Shute water Treatment Plant (via the Northern Pipeline Interconnector) supply much of the water to areas that would normally be supplied from North Pine Water Treatment Plant.

Eastern South East Queensland

- Supply from the North Stradbroke Water Treatment Plant to the Redland area will be maximised, attempting to achieve as high a production as possible to reduce the requirement from Capalaba Water Treatment Plant.
- To reduce the production of THMs, supply from the Capalaba Water Treatment Plant is generally minimised subject to operational constraints (expected to be approximately 7 megalitres per day).

- An expert panel has been convened to determine the appropriate strategy to mitigate THMs. This panel may recommend changes that will impact upon the Operating Strategy. An incident will be declared should total THMs be detected at concentration levels above 250 nanograms per litre.
- It is envisaged that the Eastern Pipeline Interconnector will predominantly be utilised to transfer the minimum volume of about 4 megalitres per day in a westerly flow direction. However, a trial will be undertaken in the near future to determine whether operation of the Eastern Pipeline Interconnector in an easterly flow direction leads to some improvement in disinfection by-product formation potential in the northern part of Redland area and chlorine residual levels in the Logan area. This will be undertaken in collaboration with Allconnex Water, Seqwater and LinkWater.

Southern South East Queensland

- The baseline operating philosophy for the Gold Coast Desalination Plant will be to operate in a standby mode. This mode of operation will ensure the plant can increase production to one third of its capacity within 24 to 48 hours. The details of this mode of operation will be developed over the coming months where the limits and conditions of operating in this mode are determined.
- The Gold Coast Desalination Plant will be instructed to increase production in response to a water quality issue or water supply issue elsewhere in South East Queensland, subject to performance testing requirements and event based water quality and system reliability needs.
- The production of desalinated water will be maximised when the volume of water stored by key Water Grid storages falls below 60% of the storage capacity of key Water Grid storages. This will ensure that the System Operating Plan risk criteria can be met in accordance with the probability assessments described earlier in this section and Section 7.
- The Southern Regional Water Pipeline will be operated at least at the minimum northerly transfer (25 megalitres per day) capacity, in order to maintain suitable water quality within the pipeline and to allow an immediate response to an asset or water quality related issue within the Brisbane area.
- The Southern Regional Water Pipeline will be utilised to manage health and taste and odour (aesthetic) related water quality issues as needed. For health issues the appropriate operational response will be determined as part of the emergency management process. For aesthetic issues, current practice is that contact is made with the SEQ Distributor Retailers to determine the level of customer enquiries once the sampling detects concentrations of taste compounds above the generally acknowledged taste threshold, and Seqwater taste panel experiences consistent samples above their threshold. The options for mitigating the issue is then determined based on the severity and extent of the taste issues experienced and number of complaints received.
- Due to the costs incurred, water will be taken from the Molendinar and Mudgeeraba water treatment plants for this purpose in preference to the Desalination Plant. The electricity costs of using the Desalination Plant for periods of high production are significant, under the current electricity purchasing arrangements.

- To ensure compliance with the long-term level of service criteria, restricting the use of the Southern Regional Water Pipeline to only operating in a northerly flow direction will generally cease if Hinze and Little Nerang Dams fall below 40% of capacity. In practice when the Hinze and Little Nerang Dams fall below 50%, the direction and extent of utilisation of the Southern Regional Water Pipeline and the utilisation of the Logan River connection will be reviewed. The utilisation and direction of these connections will be determined by the relative storage volumes across the region and the operation of the Desalination Plant.

Logan Greenbank demand zone

- The Southern Regional Water Pipeline will also be used to supply a small amount of water in the areas supplied from Greenbank reservoirs. Historically, this area has experienced low chlorine residuals and has experienced multiple detections of coliforms. It is deemed necessary that to manage the risk associated with low residuals and potential resulting bacteriological activity that some supply from the Southern Regional Water Pipeline should be provided. This comes at a very small increase in variable operating cost but provides a significant water quality benefit.

Logan Bridge Pump Station Zone

- Allconnex are currently reviewing their internal operating options for the use of this connection between Beenleigh and the central Logan area. Discussions will occur over the next few months to assess the available options to determine a preferred approach for the use of this connection and hence the implications for the operation of LinkWater and Seqwater's facilities.

Demand zones with stand-alone supplies

A number of rural communities rely on local supplies that are not connected to the remainder of the Water Grid. The security levels of these towns are determined by the performance of the local storages and transport infrastructure. The ongoing security associated with these areas will continue to be managed by:

- monitoring and assessment of raw water availability, by Seqwater and the Water Grid Manager
- drought response plans, developed by the Commission in collaboration with Seqwater
- contingency plans, developed by Seqwater
- planning and delivery of system augmentations.

Other

- The Western Corridor Recycled Water Scheme will be operated to meet the demands of the power station and the purified recycled water customers of Queensland Urban Utilities. There may also be a requirement to operate the scheme at higher production volumes for commissioning activities and to ensure that it is ready to augment drinking water supplies when key Water Grid storages as required. The scheme must also be operated in accordance with any approved Recycled Water Management Plan. This plan has been submitted to the Office of Water Supply Regulator for approval.

- The Gibson Island Advanced Water Treatment Plant and one stage of the Bundamba Advanced Water Treatment Plant will be demobilised by end June 2011, subject to operational and contractual requirements.
- The supply of manufactured water to Wivenhoe Dam from the Western Corridor Recycled Water Scheme will be maximised when key Water Grid storages fall below 40% of combined storage capacity, subject to appropriate approvals.
- The Tarong Energy Corporation may take up to 100 megalitres per annum from Wivenhoe Dam to ensure that its pumps from the dam remain in working order. No further water is to be taken from the Wivenhoe Dam unless the purified recycled water is not available.
- Water will continue to be supplied in accordance with rules 8.3, 8.7 and 8.8 of the System Operating Plan.

5.6 Refinement of the Operating Strategy

The operation of the Water Grid will be refined over forthcoming versions of the Operating Strategy. These refinements will seek to further reduce the cost of operations, while ensuring compliance with the System Operating Plan and water quality requirements and having regard to system reliability.

These refinements will be made following detailed investigation of specific issues, in partnership with relevant Grid Service Providers and Grid Customers. Current operational investigations include:

- supply to the LinkWater Capalaba Zone and related issues associated with North Stradbroke Island and EPI transfer, with a focus on the management of THMs
- supply to Maleny, with a focus the reliability of supply from the interconnecting pipeline
- supply to the South MacLean area, with a focus on the maintenance of adequate and consistent disinfection residuals examining South MacLean Water Treatment Plants short term role in supplying water to the areas south of the water treatment pant
- supply to the Central Logan area, and in particular the operation of the Logan Bridge pump station and the issue of disinfection residuals generally
- operation of the Northern Pipeline Interconnector Stage 2, including maintenance of minimum flows and triggers for changed direction of flow
- options for meeting current and forecast demand in the area supplied by Petrie Water Treatment Plant, including consideration of the need for continued operation of the Murrumba Downs Advanced Water Treatment Plant and of the disinfection regime
- operation of the Enoggera Water Treatment Plant, with a focus on the maintenance of adequate and consistent disinfection residuals.

Over the longer term there is a second group of issues which need to be resolved. For these issues, there is a clear need for all relevant parties to be involved in a collaborative planning process. It is envisaged that future versions of the Operating Strategy will reflect any agreed framework. This framework will need to address items listed below when considering the various asset groupings and areas outlined in Attachment 9:

- needs, including what each entity requires from the process
- outputs
- scope and timeframes
- priority
- process for including new issues and for updates
- governance.

For clarity, a list of the future considerations and operational decisions are included in Attachment 9. These issues were developed by a group of officers from the Water Grid Manager and key entities and are seen as necessary issues to be assessed for various reasons across all organisations.

6.0 System Operating Plan compliance

The Operating Strategy complies with all System Operating Plan requirements.

6.1 Level of service objectives and risk criteria

The SEQ Regional Water Balance Model has been used to test the proposed Operating Strategy for compliance with the level of service Objectives and risk criteria. The Operating Strategy decision templates contained in Attachment 7 define the key decisions on transfer rules and alternative sources necessary for undertaking modelling runs in the SEQ Regional Water Balance Model. Key results of the model runs are shown in Table 7 (low demand scenario) and Table 8 (high demand scenario) assuming that Wivenhoe Dam initial level is 75% while all other dams begin at their current storage. More detailed outputs are contained in Attachment 8.

Table 7: Compliance with risk criteria (low demand scenario)

Volume of water stored by key Water Grid storages	Probability of reaching volume of water stored		
	Within 1 year	Within 3 years	Within 5 years
40%	<0.01%	Not specified	0.03%
30%	Not specified	<0.01%	<0.01

Table 8: Compliance with risk criteria (high demand scenario)

Volume of water stored by key Water Grid storages	Probability of reaching volume of water stored		
	Within 1 year	Within 3 years	Within 5 years
40%	<0.01%	Not specified	0.40%
30%	Not specified	<0.01%	0.01%

It should be acknowledged that much of the detail provided above in Section 5 cannot be specifically addressed in the SEQ Regional Water Balance Model.

Results for the long term assessment are included in Table 9.

Table 9: Compliance with long-term criteria (low and high demand scenario)

Level of service objective	System Operating Plan requirements (frequency of reaching trigger, measured as average number of years)	Operating Strategy (low demand scenario)	Operating Strategy (high demand scenario)
T1	25	1,581	115
T2	100	NA	1,285
SEQ 10%	1,000	NA	NA
SEQ 5%	NA	NA	NA
Brisbane Dead Volume	NA	NA	NA
Baroon Dead Volume	NA	NA	NA
Gold Coast Dead Volume	NA	NA	NA

This modelling confirms that the Operating Strategy would achieve medium-term water security requirements and the long term level of service objectives, were this mode of operation to continue over several years. In practice, the Operating Strategy will be substantially reviewed and refined over the next year as additional information becomes available (refer Section 5). In the meantime, the six monthly reviews provide a suitable timeframe to respond to any major changes to our water security position.

6.2 Operating rules

The Operating Strategy complies with all System Operating Plan operating rules, as summarised in Table 10. The rules are explained in Section 2.2.

Table 10: Compliance with Operating Rules

Operating rule	Operating Strategy compliance
8.1 cost effective and efficient operation rule	Estimated operating costs are explained in Section 4.5. Costs have been minimised through a range of decisions, including: • operation of the Desalination Plant in standby mode, unless required for water quality or system reliability reasons • demobilisation of the Gibson Island Advanced Water Treatment Plan and one stage of the Bundamba Advanced Water Treatment Plant • minimum transfers north in Southern Regional Water Pipeline • prioritisation of cheaper sources, such as Image Flat and Landers Shute water treatment plants over Ewen Maddock Water Treatment Plant. Options to further reduce costs are being investigated (refer Section 5).
8.2 Water security rule	In accordance with the System Operating Plan, the Operating Strategy states that, when the volume of water stored by key Water Grid storages falls below 40% of the storage capacity of these storages: • the supply of manufactured water from the Desalination Plant shall be maximised. The Desalination Plant is actually scheduled to operate at capacity from the time that key Water Grid storages fall to 60% of combined capacity • the supply of manufactured water to Wivenhoe Dam from the Western Corridor Recycled Water Scheme shall be maximised, subject to appropriate approvals.
8.3 Rule for the supply of water to power stations	Purified recycled water will be the predominant source of supply to the power stations. Alternatives will only be accessed if it is unavailable, except for small volumes required to ensure that pumps remain in working order.
8.4 Rule for supply via the Northern Pipeline Interconnector Stage 1	Due to the operational constraint associated with maintenance of suitable water quality within the Northern Pipeline Interconnector, the minimum transfer volume south through the Northern Pipeline Interconnector is 20 megalitres per day. This rule allows this minimum volume to be transferred (as opposed to zero) due to the operational constraint of maintain flow in the pipeline to ensure water quality requirements can be met. The Operating Strategy pipeline will operate at this minimum level when: • the volume of water stored by Baroon Pocket, Ewen Maddock, Cooloolabin, Poona and Wappa dams as a proportion of the total storage capacity of these dams is less than or equal to the volume of water stored by Wivenhoe, Somerset and North Pine dams as a proportion of their total storage capacity • the volume of water stored by Baroon Pocket, Ewen Maddock, Cooloolabin, Poona and Wappa dams is less than 70% of the total storage capacity of these dams.

Operating rule	Operating Strategy compliance
8.5 Rule for supply from Lake MacDonald and the Upper Mary Water Supply Scheme	The Operating Strategy states that, subject to operational constraints and water entitlements: • water is to be supplied from Lake MacDonald while the dam is overflowing and may continue to be supplied until the total volume of water stored by Lake MacDonald falls below 95% of capacity after an overflowing event, before • water is to be supplied from the Upper Mary Water Supply Scheme, before • water is to be supplied from Lake MacDonald.
8.6 Rule for supply within the Warrill Valley Water Supply Scheme	The supply of water under water entitlement numbers 103187, 103184 and 103203 shall be taken meeting the following conditions: • water take is sourced from run of river flow; and • Berry's Lagoon Weir is overflowing.
8.7 Rule for supply within the Logan River Water Supply Scheme	Water shall not be supplied under water entitlements located within the Logan River Water Supply Scheme, to meet demands other than those of the towns of Beaudesert, Kooralbyn, Rathdowney, South Maclean and Jimboomba, when Maroon Dam is at or below elevation 193.23 meters Australian Height Datum.

Attachment 1: South East Queensland Water Strategy context

The SEQ Water Strategy explains the context for key concepts contained in the System Operating Plan, as summarised below.

Level of service objectives

The level of service objectives are performance objectives for the delivery of bulk water supplies from the Water Grid.

The level of service approach acknowledges that future severe droughts will occur, and that water restrictions are an effective and efficient way of managing the impact of these droughts— but restrictions can have a significant impact on the community. The SEQ Water Strategy explains that the level of service objectives for South East Queensland have been developed on the basis that in order to maintain a comfortable lifestyle, the community would prefer to use Permanent Water Conservation Measures coupled with Medium Level Restrictions in times of drought. In normal times, this means that water will be used wisely. In periods of drought, Medium Level Restrictions will be introduced early enough and at such a level that they avoid negative impacts on community amenity and the regional economy. For instance, in future droughts it is expected that restrictions would not require a ban on handheld hosing and water efficient sprinklers.

Level of service system yield

The level of service system yield is the volume of water that can be supplied from the Water Grid every year and still achieve the level of service objectives.

The level of service system yield is less than is permitted under water resource plans and resource operations plans. The SEQ Water Strategy explains that this is because in order to achieve the level of service objectives, water must be 'banked' in the wetter periods so that it is available during droughts that may be worse or more frequent than has occurred in the last 100 years. Fully using the available allocation could place the urban community at risk of supply failure during extended drought, especially from droughts worse than those that have been experienced since records were kept.

While the level of service system yield of the Water Grid is less than the sum of the allocations held by the Water Grid Manager for urban use, it is larger than the sum of the level of service yields of the individual systems.

Using less urban water than permitted under water allocations issued in compliance with water resource plans generally results in dam levels being higher than would otherwise be the case, because additional reserves are held in storage. In turn, this results in an increased likelihood of overflows from dams with associated environmental benefits and higher announced allocations for rural irrigation.

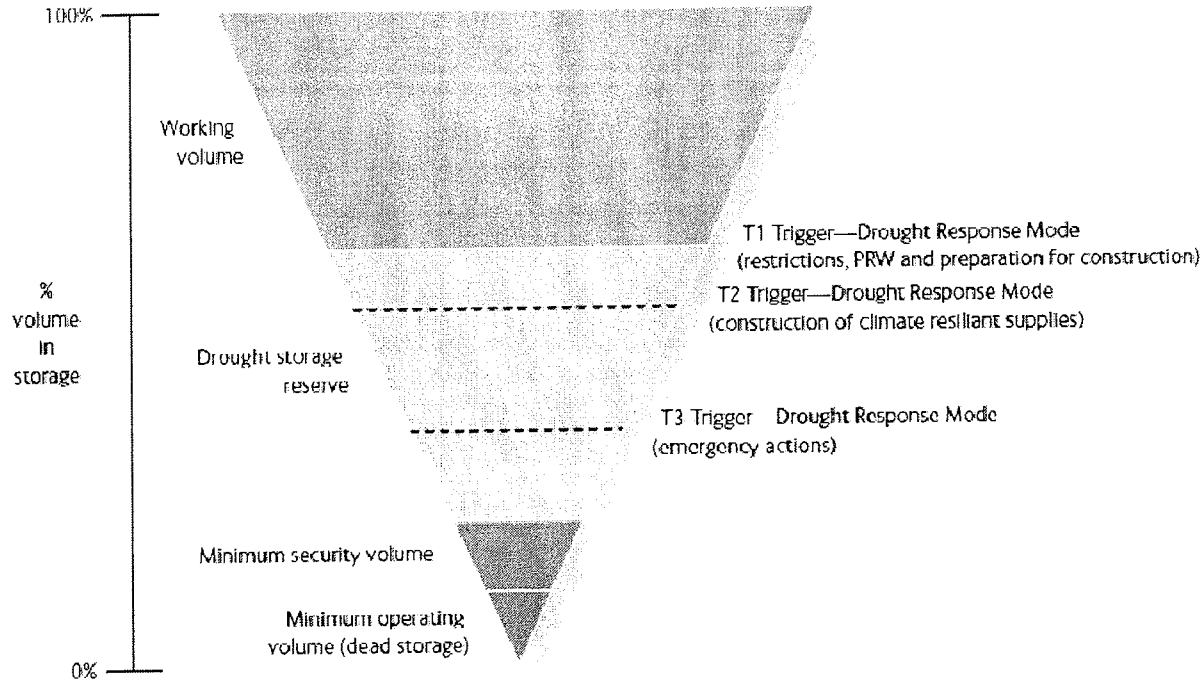
Drought response triggers

The SEQ Water Strategy partitions the water storage compartment in South East Queensland dams both individually and as a combined total South East Queensland system into:

- working volume
- drought storage reserve
- minimum security volume
- minimum operating volume (dead storage).

The figure below illustrates the partitioning of the water storage compartment of South East Queensland's dams. These partitions apply both to individual dams and across the Water Grid as a whole. Many individual dams are also constructed with a flood storage compartment that sits above the water storage compartment.

Partitioning of key Water Grid storages.



The normal operating mode applies when the Water Grid is within the working volume. This mode will apply over most periods in the long-term, consistent with the level of service objectives. Below the working volume is the drought storage reserve. The combined Water Grid drought storage reserve underpins the drought response plan. The drought storage reserve is sized to provide, in conjunction with climate resilient sources, a minimum of 36 months supply of water at a restricted demand.

At this time, the partitioning of individual dams defined as key Water Grid storages will be the same as the partitioning of the overall Water Grid. That is, the working volume of each dam will be between 40% and 100% of storage capacity. The actual volume of the drought storage reserve may vary over time according to the mix of supplies and the demand for water.

Within the combined Water Grid drought storage reserve there are three trigger levels:

- T1 is the trigger to enter the drought response mode (preparation phase). It applies when regional storage volumes drop down into the drought storage reserve. Pre-planned Medium Level Restrictions will be introduced and purified recycled water will be added to Wivenhoe Dam at this time. This phase provides time to prepare for construction, in the event of continued drought conditions.
- T2 is the trigger to enter the drought response mode (construction phase). It applies when construction of new climate resilient or climate independent water supplies, such as desalination plants, is required to commence to ensure that the restricted water demands for the community can be met for the duration of a long, severe drought.
- T3 is the trigger to enact emergency measures.

For the Water Grid, the risk of drawing down to operationally significant storage levels, such as T1 or T2, will depend on the current storage volume within the system. Larger storage volumes, coupled with the increased opportunity for conjunctive system operation, result in a reasonably long period over which supply can be maintained with below average inflows without drawing down to these trigger levels. However, operational decisions made when storage volumes are relatively high can still have a significant effect on regional water security (and potential infrastructure expenditure) if extended periods of low inflows are experienced.

Risk criteria in the System Operating Plan enable timely modification of system operation to ensure that these risks are maintained within acceptable levels to the extent that is possible.

Climate change assumption

The maximum volume that the Water Grid Manager is permitted to sell under contract represents the level of service system yield of existing infrastructure with an immediate 10% reduction in the level of service yield of surface storages due to climate change.

This is a conservative assumption. The SEQ Water Strategy explains that the impacts of climate change are likely to occur over decades. It states that, as a conservative estimate, a 10% reduction in surface water availability is likely to occur by 2030. This contrasts with Perth, where there is evidence that a change in inflows has already occurred.

More analysis is necessary to improve our understanding of climate change impacts. Such work is being progressed by the Queensland Government Climate Change Centre of Excellence and the CSIRO, through the SEQ Urban Water Security Research Alliance. Over time, this work will downscale the CSIRO global model simulations, and simulations from six other international modelling groups, to a 14 to 20 kilometre resolution for South East Queensland. It will result in a better integration between the climate change models and hydrologic modelling.

In the meantime, case studies indicate that by 2031 the annual stream flow for the Brisbane River downstream of Mt Crosby Weir could be reduced in a dry scenario by up to 28% or increased by up to 14% in a wet scenario. Such impacts are expected to be highly variable across the whole of South East Queensland.

Attachment 2 Key Interface Points

Figure A2.1: Northern Key Interface Points

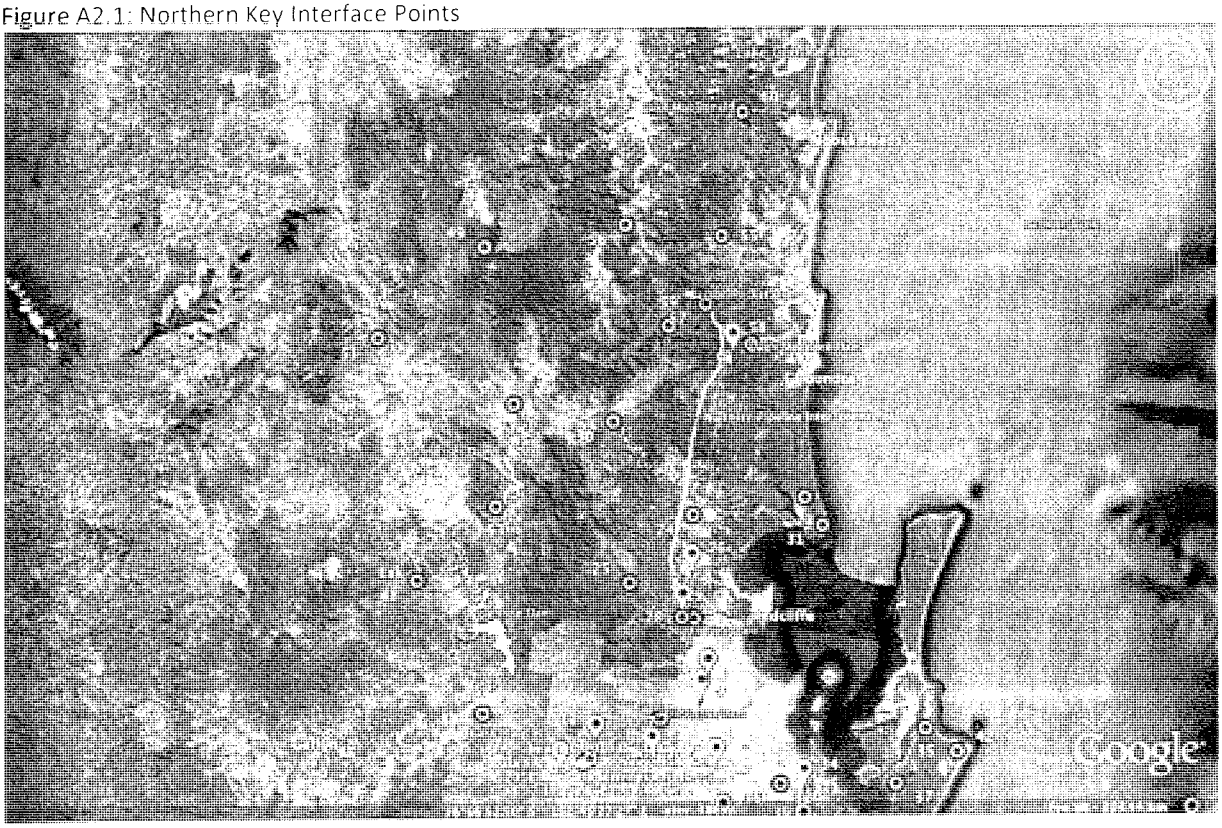


Figure A2.2: Southern Key Interface Points

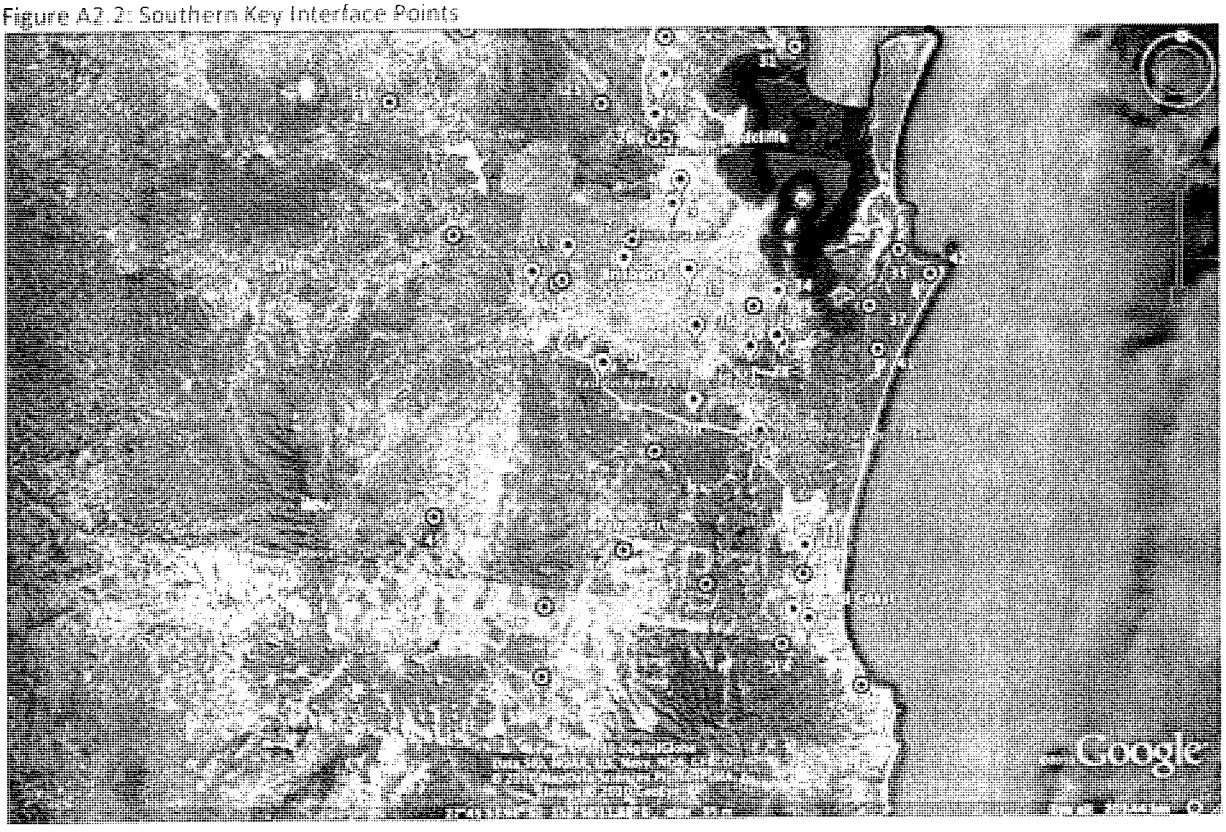


Table A2.1: KIP register extract

Water Grid KIP ID	Water Grid region	Grid Service Provider region	KIP name	Grid Service Provider sample point ID	Area that water quality is representative of	Asset type
1	Brisbane	Brisbane	Aspley Reservoir Outlet	LW-BTA01-R007	Water in north Brisbane, It is a conduit for water travelling north from Mt Crosby/Southern Regional Water Pipeline (SRWP) via Sparkes Hill Reservoir to Moreton and Redcliffe and water travelling south to Brisbane from North Pine and NIP.	Reservoir
2	Brisbane	Moreton	Enoggera WTP KIP	Enoggera WTP	Water leaving WTP to supply the QUU's Gap Reservoir	Water Treatment Plant
3	Brisbane	Mt Crosby	Kholo (Mid Brisbane River) KIP		Raw water in the Mid-Brisbane River flowing to the Mt Crosby Weir	Raw Water
4	Brisbane	Brisbane	Kuraby Reservoir Outlet	LW-BTA01-R004	Water supplying Logan and South Brisbane. Water from Mt Crosby/SRWP and possibly water from the Logan Zone via the Trinder Park Pump Station.	Reservoir
5	Brisbane	Mt Crosby	Mt Crosby East Bank WTP KIP	Mt Crosby East Bank	Water leaving the WTP to supply Cameron's Hill Reservoir and the Ipswich Western Main	Water Treatment Plant
6	Brisbane	Mt Crosby	Mt Crosby West Bank WTP KIP	Mt Crosby West Bank	Water leaving the WTP to supply Cameron's Hill Reservoir and the Ipswich Western Main	Water Treatment Plant
7	Brisbane	Brisbane	Mt Crosby WTP & SRWP Mixed Water	LW-BTA01-TM024	Water from Cameron's Hill Reservoir combine with water from the SRWP if operating in a northerly direction It represents water supplying Brisbane and Ipswich, Logan and the Gold Coast if the SRWP is operating in southerly direction.	Trunk Main
8	Brisbane	Brisbane	Sparkes Hill Reservoirs Combined Inlet	LW-BTA01-TM026	Water entering the reservoir from either Aspley in the north or Mt Crosby/SRWP (possibly via the Green Hill Res).	Trunk Main

9	Brisbane	Brisbane	Sparkes Hill Reservoirs Combined Outlet	LW-BTA01-TM025	Water leaving the Sparkes Hill Reservoir supply Brisbane and/or travelling North to the Aspley Reservoir or south to the Brisbane bulk distribution.	Trunk Main
10	Brisbane	Brisbane	Wellers Hill Reservoirs Combined Outlet	LW-BTA01-TM020	Water supplying QUU's Mt Gravatt and Cavendish Road Reservoir and Brisbane reticulation.	Trunk Main
11	Brisbane	Brisbane	Green Hill Reservoir Outlet	LW-BTA01-R001	Water supplied Brisbane and the bulk distribution. Receives water from Mt Crosby/SRWP or from the north via Sparkes Hill Reservoir. Can supply water to Sparkes Hill, Wellers Hill and Kuraby Reservoirs.	Reservoir
12	Gold Coast	SRWP	Molendinar Key Interface Point	LW-SRP-TM014	Mixed water from Molendinar WTP/NIP and SRWP.	Trunk Main
13	Gold Coast	Gold Coast	Molendinar WTP KIP	Molendinar WTP	Water from the WTP entering the Molendinar Reservoirs.	Water Treatment Plant
14	Gold Coast	Gold Coast	Mudgeeraba WTP KIP	Mudgeeraba WTP	Water from the WTP supplying the southern Gold Coast and mixing with the desalinated water at the Robina Mixing Tank.	Water Treatment Plant
15	Gold Coast	Gold Coast	Robina Reservoir Outlet (Clover Hill)	LW-BTA02-R001	Water supplying the southern Gold Coast. Water in the reservoir is received from the Mudgeeraba WTP or water from the Mudgeeraba blended with desalinated water.	Reservoir
16	Gold Coast	SRWP	Stapylton Balance Tank Outlet	LW-SRP-R003	Water travelling north or south along SRWP. Either chlorinated water from Molendinar Reservoirs (north) or water that has been break-point chlorinated at the Chambers Flat Pump Station (south).	Reservoir
17	Gold Coast	NIP	Tarrant Drive Pump Station (Robina Mixing Tank Outlet)	LW-NIP-TM006	Water being supplied north in the NIP, post Robina Mixing Tank. Water is from the Mudgeeraba WTP or from Mudgeeraba blended with desalinated water.	Trunk Main

18	Gold Coast	Gold Coast	Tugun DP KIP	Tugun DP	Water leaving the Tugun Desalination Plant.	Desalination Plant
19	Ipswich	SRWP	North Beaudesert Balance Tank 1	LW-SRP-R001	Water travelling north in SRWP post chloramination. In a southerly direction water from Mt Crosby supplied to the Logan and to be break-point chlorinated at Chambers Flat Pump Station.	Reservoir
20	Logan	SRWP	Chambers Flat WQMF North Panel*	LW-SRP-TM009	Water that has been break-point chlorinated at the chambers Flat PS and is supplied to Logan or the NBBT.	Trunk Main
21	Logan	Logan	Kimberley Park Reservoir Outlet	LW-BTA04-R001	Water leaving the Kimberley Park res and supply either Logan reticulation (including the Springwood Reservoir (Allconnex Water), Kuraby Reservoir (via Trinder Park Pump Station) or the EPI (in an easterly flow). Water can be received from the EPI (westerly flow), from Kuraby Reservoir (via Daisy Hill Pump Station) or possibly from the Allconnex Water Logan River Pump Station (chloraminated water from North Gold Coast).	Reservoir
22	Logan	Logan	South Maclean WTP KIP	South Maclean WTP	Water leaving WTP to supply South Maclean and Logan zones.	Water Treatment Plant
23	Moreton Bay	Moreton	Banksia Beach WTP KIP	Banksia Beach WTP	Water leaving WTP supplying the Bribie Island zone.	Water Treatment Plant
24	Moreton Bay	Moreton	Caboolture WTP KIP	Caboolture WTP	Water leaving WTP supplying the Caboolture zone.	Water Treatment Plant
25	Moreton Bay	Moreton	Dayboro WTP KIP	Dayboro WTP	Water supply to Dayboro zone	Water Treatment Plant

26	Moreton Bay	NPI	Narangba Reservoirs Combined Outlet	LW-NPI-R004	Water leaving the Narangba Res supplying the North Pine PS and LinkWater Caboolture Zone (including the Unity Water Morayfield Reservoir) Water from the reservoir is received from the NPI south (Lander's Shute WTP) and Byrnes Road PS and in some scenarios the Unity Water Morayfield Res.	Trunk Main
27	Moreton Bay	NPI	North Pine WTP & NPI Mixed Water (Byrnes Road PS)	LW-NPI-TM007	Mixed water (NPI and North Pine WTP water and possibly water from north Brisbane) being pumped north to Caboolture (including UnityWater Morayfield Reservoir) and the Narangba Reservoir.	Trunk Main
28	Moreton Bay	Moreton	North Pine WTP KIP	North Pine WTP	Water leaving WTP to supply Pine Rivers, Aspley Res and possibly Redcliffe.	Water Treatment Plant
29	Moreton Bay	Moreton	Petrie WTP KIP	Petrie WTP	Water leaving WTP to supply Petrie, AMCOR and Redcliffe	Water Treatment Plant
30	Moreton Bay	Moreton	Woodford WTP KIP	Woodford WTP	Water leaving WTP supplying Woodford.	Water Treatment Plant
31	Moreton Bay		Woorim WTP KIP	Bribie Island WTP	Water leaving WTP supplying Bribie Island. Not operational.	Water Treatment Plant
32	Redland	Redland	Alexandra Hills Reservoirs Capalaba Inlet/Outlet	LW-BTA03-TM001	Water coming in from the Capalaba WTP and leaving the reservoir to Capalaba Reticulation.Water in the reservoir can come from the Heinemann Road Reservoir (via Mt Cotton).	Trunk Main
33	Redland	Redland	Alexandra Hills Reservoirs Combined Outlet - North	LW-BTA03-TM002	Water leaving the reservoir and supplying Capalaba. Water in the reservoir can come from the Heinemann Road Reservoir (via Mt Cotton).	Trunk Main
34	Redland	Redland	Alexandra Hills Reservoirs Combined Outlet - South	LW-BTA03-TM003	Water leaving the reservoir supply Redland Reticulation and Mt Cotton Reservoir. Water in the reservoir can come from the Heinemann Road Reservoir (via Mt	Trunk Main

					Cotton).	
35	Redland	Redland	Amity Point WTP KIP	Amity Point WTP	Supplies Amity Point Zone	Water Treatment Plant
36	Redland	Redland	Capalaba WTP KIP	Capalaba WTP	Water leaving WTP supplying Alexandra Hills Reservoir and Capalaba	Water Treatment Plant
37	Redland	Redland	Dunwich WTP KIP	Dunwich WTP	Supplies Dunwich Zone	Water Treatment Plant
38	Redland	Redland	Heinemann Rd Reservoir 1 Outlet	LW-BTA03-R007	Water supplied to the EPI (westerly flow), Redland Reticulation and Mt Cotton Reservoir (possibly to Alexandra Hills Reservoir) Water from the NSI WTP, EPI (in an easterly flow) and possibly the Capalaba WTP (via Mt Cotton Reservoir).	Reservoir
39	Redland	Redland	Heinemann Rd Reservoirs 2 & 3 Combined Outlet	LW-BTA03-TM004	Water supplied to the EPI (westerly flow), Redland Reticulation and Mt Cotton Reservoir (possibly to Alexandra Hills Res) Water from the NSI WTP, EPI (in an easterly flow) and possibly the Capalaba WTP (via Mt Cotton Reservoir).	Trunk Main
40	Redland	Redland	Mount Cotton Reservoir Inlet/Outlet	LW-BTA03-R006	Water supplied to the Redland Reticulation, Heinemann Road. and Alexandra Hills Reservoir. Water from the NSI WTP and the Capalaba WTP.	Reservoir
41	Redland	Redland	North Stradbroke WTP KIP	NSI WTP	Water from the WTP supplying the bay island and mainland via the Heinemann Rd Res.	Water Treatment Plant
42	Redland	Redland	Point Lookout WTP KIP	Point Lookout WTP	Water supplied to point Lookout.	Water Treatment Plant
43	Scenic Rim	Scenic Rim	Canungra WTP KIP	Canungra WTP	Water supplied to Canungra.	Water Treatment Plant
44	Scenic Rim	Scenic Rim	Helen St WTP KIP	Helen Street WTP	Water supplied to Beaudesert.	Water Treatment Plant
45	Scenic Rim	Scenic Rim	Kalbah WTP KIP	Boonah-Kalbah WTP	Water supplied to Boonah & Kalbah.	Water Treatment Plant
46	Scenic Rim	Scenic Rim	Kooralbyn WTP KIP	Kooralbyn WTP	Water supplied to Kooralbyn.	Water Treatment Plant
47	Scenic Rim	Scenic Rim	Rathdowney WTP KIP	Rathdowney WTP	Water supplied to Rathdowney.	Water Treatment Plant

48	Somerset & Lockyer	Somerset	Esk WTP KIP	Esk WTP	Water supplied to Esk	Water Treatment Plant
49	Somerset & Lockyer	Somerset	Jimna WTP KIP	Jimna WTP	Water supplied to Jimna	Water Treatment Plant
50	Somerset & Lockyer	Somerset	Kilcoy WTP KIP	Kilcoy WTP	Water supplied to Kilcoy	Water Treatment Plant
51	Somerset & Lockyer	Somerset	Linville WTP KIP	Linville WTP	Water supplied to Linville.	Water Treatment Plant
52	Somerset & Lockyer	Somerset	Lowood WTP KIP	Lowood WTP	Water supplied to Lowood.	Water Treatment Plant
53	Somerset & Lockyer	Somerset	Somerset Dam WTP KIP	Somerset Dam township WTP	Water supplied to Somerset township.	Water Treatment Plant
54	Sunshine Coast	Sunshine Coast	Ewen Maddock WTP KIP	Ewen Maddock WTP	Water supplied to Caloundra.	Water Treatment Plant
55	Sunshine Coast	Sunshine Coast	Image Flat WTP KIP	Image Flat WTP	Water supplied to the north of the Sunshine Coast: Nambour, Woombye, Palmwoods and possibly Peregian Beach and/or Maroochydore.	Water Treatment Plant
56	Sunshine Coast	Sunshine Coast	Kenilworth WTP KIP	Kenilworth WTP	Water supplied to Kenilworth.	Water Treatment Plant
57	Sunshine Coast	Sunshine Coast	Landers Shute WTP KIP	Landers Shute WTP	Water supplied to Maroochydore (Tanawha Reservoir), Caloundra and the NPI. Also supplies the NPI to the south.	Water Treatment Plant
58	Sunshine Coast	NPI	Landsborough WQMF South Panel**	LW-NPI-TM002	Water travelling south along the NPI following chloramination and represent the Elimba and Morayfield off-takes.	Trunk Main
59	Sunshine Coast	Sunshine Coast	Maleny WTP KIP	Maleny WTP	Water supplied to Maleny.	Water Treatment Plant
60	Sunshine Coast	Sunshine Coast	Noosa WTP KIP	Noosa WTP	Water supplied to Noosa.	Water Treatment Plant

Attachment 3: Preferred and alternative supply options by demand zone

Grid region	Demand zone	Supply option	Status	Key considerations	Trigger to implement option	Comment
Redland	LinkWater Capalaba Zone	Capalaba WTP only (EPI west)	Current	THM potential in water from Capalaba		Part of the Capalaba WTP zone is supplied directly from the main going from the WTP to the Alexandra Hills reservoir.
Redland	LinkWater Capalaba Zone	Blend: Capalaba and North Stradbroke Island WTPs (EPI westerly flow direction)	Current	Cost of production at Capalaba vs North Stradbroke Island (including pumping from Capalaba to Alex Hills res and from North Straddle to the mainland)		The remainder of the zone is supplied with blended water with water coming via the Bunker Road connection to the Alexandra Hills reservoir.
Redland	LinkWater Capalaba Zone	Blend: Capalaba, North Stradbroke Island WTPs and EPI (easterly flow direction)	Option	Cost of pumping westward in the EPI at Gramzow Rd	Significant failure of North Stradbroke Island or Capalaba WTP	
Redland	LinkWater Capalaba Zone			Risk associated with break point chlorination in water from EPI going eastward	Storage levels in Leslie Harrison Dam reach low levels and the NSI WTP was at risk of being unable to meet demand	
Redland	LinkWater Capalaba Zone			Potential taste changes associated with water that has been break point chlorinated.		
Redland	LinkWater North Stradbroke Island Zone	North Stradbroke Island WTP only (EPI west)	Current			
Redland	LinkWater North Stradbroke Island Zone	Blend: North Stradbroke Island WTP and EPI easterly flow direction	Option	Risks associated with break point chlorination in water from EPI eastward, such as chlorate	Significant failure of North Stradbroke Island or Capalaba WTPs. Storage levels in Leslie Harrison Dam reaches low levels and the NSI WTP was at risk of being unable to meet demand.	
Redland	LinkWater North Stradbroke Island Zone	Capalaba WTP only (EPI west)	Current			
Redland	Dunwich Zone	Dunwich WTP only	Current	No option		
Redland	Amity Point Zone	Amity Point WTP only	Current	No option		
Redland	Point Look Out Zone	Point Look Out WTP only	Current	No option		
Gold Coast	LinkWater Northern Mixed Zone	Molendinar WTP only (SRWP north)	Option	System Operating Plan requires that the Gold Coast Desalination Plant be operated at a minimum of one-third of capacity Aim to maintain average monthly consumption either below or above 125 megalitres per day, which is the threshold above which Molendinar WTP requires the use of the pumped transfer of raw water from Hinze Dam	Gold Coast Desalination Plant is unavailable	Location in this zone will determine the actual composition of water delivered, as there is a degree of connectivity between the northerly and southern mixed zones. Different compositions of water will exist throughout these areas
Gold Coast	LinkWater Northern Mixed Zone	Blend: Gold Coast Desalination Plant, Mudgeeraba and Molendinar WTPs (SRWP north)	Current		Desalination Plant utilisation is maximised when key Water Grid storage levels fall to 60% of capacity	
Gold Coast	LinkWater Northern Mixed Zone	Blend: Gold Coast Desalination Plant, Mudgeeraba & Molendinar WTPs and SRWP (southerly flow direction)	Option	Major reduction in Gold Coast water security		
Gold Coast	LinkWater Northern Mixed Zone			Risk associated with break point chlorination-chlorate levels		

A81

Grid region	Demand zone	Supply option	Status	Key considerations	Trigger to implement option	Comment
Gold Coast	LinkWater Southern Mixed Zone	Blend: Gold Coast Desalination Plant, Mudgeeraba & Molendinar WTPs (SRWP north)	Current	Maintain consistent blend ratio of desalinated water in the zone, particularly the area fed from the Robina mixing tank which is the area that receives a blend most of the time		
Gold Coast	LinkWater Southern Mixed Zone	Blend: Gold Coast Desalination Plant, Mudgeeraba & Molendinar WTPs and SRWP (southerly flow direction)	Option	Availability of Mudgeeraba WTP	Hinze and Little Nerang dams reach low levels	
Gold Coast	LinkWater Southern Mixed Zone	Mudgeeraba WTP only (SRWP north)	Option	Aim to maintain average monthly consumption either below or above 125 megalitres per day, which is the threshold above which Molendinar WTP requires the use of the pumped transfer of raw water from Hinze Dam	Gold Coast Desalination Plant is not operating or operating at one-third capacity. In these circumstances, this zone will receive no or very little desalinated water (and then potentially only in Robina)	
Gold Coast	LinkWater Southern Mixed Zone	Blend: Tugun and Mudgeeraba (SRWP north)	Current			
Gold Coast	LinkWater Coolangatta Currumbin Zone	Supplied via the LinkWater Southern Mixed Zone	Current			
Gold Coast	LinkWater Coolangatta Currumbin Zone	Gold Coast Desalination Plant only	Option		Failure at Mudgeeraba WTP	
Gold Coast	LinkWater Mudgeeraba Zone	Mudgeeraba WTP only	Current	No Option		
Logan	Underwood Road Zone	Supplied by the LinkWater Brisbane Zone	Option		Connection from Brisbane to Logan zone opened should WQ in that connection require it.	
Logan	Underwood Road Zone	Supplied by the LinkWater Logan Zone	Current			
Logan	LinkWater Logan Zone	Blend: - Mt Crosby WTP via Brisbane (major) - EPI (moderate) - Logan River Pump Station (moderate) - Pub Lane Pump Station (Minor)	Option	Water quality incidents in Central Logan area		
Logan	LinkWater Logan Zone	Blend: - Mt Crosby WTP via Brisbane (major) - EPI (moderate) - Logan River Pump Station (minor) - Pub Lane Pump Station (Minor)	Current			
Logan	LinkWater Logan Zone	Blend: - Mt Crosby WTP via Brisbane (major) - Logan River Pump Station (minor) - Pub Lane Pump Station (minor) supplying Redland via the EPI (eastward flow)	Option			
Logan	Teviot Rd Zone	Using Teviot Road connection to the area supplied by Greenbank reservoir	Current	WQ outcomes improve chlorine residual in this area. *E. coli* and other coli forms have been detected and this supply		
Logan	Teviot Rd Zone	Supply via LinkWater (Logan) – effectively part of LinkWater (Logan)	Option		SRWP was unavailable	
Logan	Logan River Pump station Zone	Supplied effectively as part of the LinkWater Logan Zone (with Logan Bridge Pump Station connection supplying south)	Option		Water quality in Logan Central being unacceptable, such as due to low chlorine residuals or multiple *E. coli* detections	
Logan	Logan River Pump station Zone	Supplied by the Logan River Pump Station operating in a northerly	Current			

A82

Grid region	Demand zone	Supply option	Status	Key considerations	Trigger to implement option	Comment
		direction				
Logan	Beenleigh Zone	Supplied via the Gold Coast LinkWater Northern Mixed Zone	Current			
Logan	Beenleigh Zone	Blend: Gold Coast Desalination Plant, Mudgeeraba & Molendinar WTPs and Logan River connection moving water south	Option		Water quality improvements be required in the Logan zone Hinze Dam reaches 60% and Wivenhoe Dam is at a higher level	
Logan	South Mclean Zone	South MacLean WTP only	Current			
Brisbane	LinkWater Brisbane Zone	Mt Crosby WTP only (NPI north & SRWP south)	Option	Likelihood of receiving inflow to Hinze Dam relative to Wivenhoe Dam		
Brisbane	LinkWater Brisbane Zone	Blend: Mt Crosby WTP and SRWP (NPI north)	Option		NPI operated in northerly direction should Sunshine Coast Dams reach 40% to 60%, subject to the volumes in other dams such as North Pine Somerset and Wivenhoe Dams	NPI Stage 2 required for this option to be implemented
Brisbane	LinkWater Brisbane Zone	Blend: Mt Crosby & North Pine WTPs and NPI (SRWP south)	Option	Contribution of North Pine WTP to the Brisbane zone, taking into account the efficiency of operation of the North Pine WTP		
Brisbane	LinkWater Brisbane Zone	Blend: Mt Crosby & North Pine WTPs, NPI and SRWP	Current			
Brisbane	Enoggera Zone	Enoggera WTP only	Option	Water quality benefits of operating Enoggera WTP compared to supply from Green Hills	Chlorine residual insufficient in supply from LinkWater Brisbane zone during summer	
Brisbane	Enoggera Zone	Supplied by the LinkWater Brisbane Zone	Current	Cost of production at Mt Crosby WTP (plus pumping) compared to cost of production at the Enoggera WTP	Likely mode of operation for winter as chlorine residual is usually suitable at that time	
Brisbane	Brisbane Aquifer Zone	Brisbane Aquifer WTPs only	Option	Costs of production at the Aquifer WTPs compared with the costs of production at Mt Crosby WTP	If there is a need to continue operating one of these plants to maintain necessary skills and knowledge this option will be set in place	Skills and knowledge issues excepted, Aquifer WTPs are not required over the next five years
Brisbane	Brisbane Aquifer Zone	Supplied by the LinkWater Brisbane Zone	Current	Water quality from Brisbane aquifers		
Ipswich	LinkWater Ipswich Zone	Blend: Mt Crosby WTP and SRWP	Current	Dependant on the method of supply to LinkWater Brisbane		Some of this zone will be supplied directly from the Mt Crosby WTP, regardless of whether the SRWP is operating in a northerly direction, due to network configuration
Ipswich	LinkWater Ipswich Zone	Mt Crosby WTP only	Option			
Scenic Rim	Peak Crossing Zone	Supplied by the LinkWater Ipswich Zone	Current	No option		
Scenic Rim	Boonah Kalbar Zone	Kalbar WTP only	Current	No option		
Scenic Rim	Beaudesert Zone	Beaudesert WTP only	Current	No option		
Scenic Rim	Kooralbyn Zone	Kooralbyn WTP only	Current	No option		
Scenic Rim	Rathdowney Zone	Rathdowney WTP only	Current	No option		
Scenic Rim	Canungra Zone	Canungra WTP only	Current	No option		
Somerset	Jimna Zone	Jimna WTP only	Current	No option		
Somerset	Kilcoy Zone	Kilcoy WTP only	Current	No option		
Somerset	Lake Somerset Zone (Kilcoy)	Lake Somerset WTP only	Current	No option		
Somerset	Esk/Toogoolawah Zone	Esk WTP only	Current	No option		
Somerset	Somerset Township Zone	Somerset Township WTP only	Current	No option		
Somerset	Linville Zone	Linville WTP only	Current	No option		

A83

Grid region	Demand zone	Supply option	Status	Key considerations	Trigger to implement option	Comment
Somerset	Tarampa Minden Zone	Supplied via the Lowood/ Fernvale Zone	Current	No option		
Somerset	Lowood/ Fernvale Zone	Lowood WTP only	Current	No option		
Lockyer Valley	Lockyer Valley Zone	Supplied via the Lowood/ Fernvale Zone	Current	No option		
Sunshine Coast	Maroochy Kenilworth Zone	Kenilworth WTP only	Current	No option		
Sunshine Coast	Caloundra Maleny Zone	Maleny WTP only	Option			No treatment required at Maleny for at least five years
Sunshine Coast	Caloundra Maleny Zone	Landers Shute WTP	Current	Cost and water quality improvements in supply from Landers Shute WTP		Effectively becomes part of the Caloundra Landers Shute Zone under this option
Sunshine Coast	Noosa WTP Zone	Noosa WTP only	Current	No option		
Sunshine Coast	Maroochy Image Flat Zone	Image Flat WTP only	Current	Image Flat WTP can supply Palmwoods and Woombye, reducing demand on the Landers Shute WTP Cost of treatment at Image Flat WTP compared to Landers Shute WTP		
Sunshine Coast	Maroochy Image Flat Zone	Blend: Image Flat and Landers Shute WTPs	Option	Image Flat WTP supplying Palmwoods Woombye puts more demand on Image Flat and		
Sunshine Coast	Ewen Maddock Zone	Ewen Maddock WTP only	Current	Likelihood of receiving inflow to Ewen Maddock Dam compared to Baroon Pocket Dam		
Sunshine Coast	Ewen Maddock Zone	Lander's Shute WTP only	Option		Full Ewen Maddock Dam water entitlement used within the water year	
Sunshine Coast	Maroochy Lander's Shute Zone	Lander's Shute WTP only	Current			Part of this zone is supplied with water direct from Landers Shute (Railway towns and parts of northern Caloundra area fed by the northern arm of the Stage 2 main) while the rest is supplied with blend from Ewen Maddock and Landers Shute
Sunshine Coast	Caloundra Lander's Shute Zone	Blend: Ewen Maddock and Lander's Shute WTPs	Current	Likelihood of receiving inflow to Ewen Maddock vs Baroon Pocket Dam Higher cost of production at Landers Shute WTP compared to Ewen Maddock WTP Having the Ewen Maddock WTP operating reduces the overall take from Landers Shute WTP Water quality in Baroon Pocket Dam, particularly blue green algae over summer months	If blue green algae occurs and output from Landers Shute WTP is reduced due to increased filter backwash frequency. Likely to be a summer operating mode as most summers Baroon Pocket is affected by blue green algae. Having Ewen Maddock WTP producing will slightly reduce the pressure on the Lander's Shute WTP.	
Moreton Bay	Dayboro Zone	Dayboro WTP only	Current	No option		

Grid region	Demand zone	Supply option	Status	Key considerations	Trigger to implement option	Comment
Moreton Bay	Woodford Zone	Woodford WTP only	Current	Risk associated with customer service standards to those customers taking water directly from the Caboolture to Woodford Pipeline. Very high pressure in the main pipe. If PRV fails customers would to experience dramatic failures.		
Moreton Bay	Woodford Zone	Supply from Caboolture network	Option	Cost comparison between UnityWater pumping up the hill and Seqwater producing at Woodford WTP	If Woodford WTP is unavailable, water available in the Stanley River is insufficient or quality of raw water is poor such that treated water quality is compromised	An assessment of what is best for the Grid as a whole is required for this supply zone, including water quality triggers to cease supply from Woodford WTP
Moreton Bay	LinkWater Caboolture Zone	Lander's Shute WTP only (NPI south)	Option			
Moreton Bay	LinkWater Caboolture Zone	Blend: Lander's Shute and North Pine WTPs (NPI south to Narangba and Byrnes Rd pump station moving water north to Narangba)	Option	Levels in Sunshine Coast dams relative to Wivenhoe, North Pine and Somerset dams. If Sunshine Coast dams are less full (as a percentage then transfer south in NPI needs to be minimised	Levels in Sunshine Coast Dams increases to 70% or are below Wivenhoe, Somerset and North Pine dams	
Moreton Bay	LinkWater Caboolture Zone	North Pine only (NPI north all the way to Caloundra mains)	Option	Cost of producing water and transferring it to Morayfield and Narangba compared to production at the Caboolture WTP Cost of producing water and transferring it to Morayfield and Narangba compared to producing at North Pine WTP and transferring via Byrnes Rd to Narangba	NPI Stage 2 is required for this option	
Moreton Bay	LinkWater Caboolture Zone	Blend: Lander's Shute and Caboolture WTPs with NPI southerly flow supplying to Morayfield, Narangba and to North Pine WTP	Current			
Moreton Bay	LinkWater Caboolture Zone	Landers Shute WTP supply via NPI to Morayfield and Narangba (Caboolture WTP offline)	Option			
Moreton Bay	Bribe Island Zone	Banksia Beach WTP only	Current	Performance of Banksia Beach WTP. If unable to produce enough water some LinkWater supply will need to be made available at Morayfield		
Moreton Bay	Bribe Island Zone	Woorim WTP only – not operational	Option			
Moreton Bay	Bribe Island Zone	Blend: Banksia Beach and supply via the LinkWater Caboolture Zone	Current			
Moreton Bay	Caboolture WTP Zone	Caboolture WTP only	Option	Costs of production at Caboolture WTP compared to NPI or North Pine WTP via Byrnes Rd and Narangba to Morayfield		
Moreton Bay	Caboolture WTP Zone	Supply via the LinkWater Caboolture Zone with NPI in Southerly flow direction and Caboolture WTP offline	Option	Costs of production at Caboolture and water quality risks lead to the preferred approach to minimise production from Caboolture WTP	Set in place if Caboolture WTP is unavailable due to poor raw water quality or other reason	
Moreton Bay	Caboolture WTP Zone	Blend: Caboolture WTP and NPI	Current			
Moreton Bay	Petrie Demand Zone	Petrie WTP only	Current	No option		
Moreton Bay	LinkWater Pine Rivers Zone	North Pine WTP only (NPI north)	Option	Water quality in the transition zone where water from the Mt Crosby WTP meets water from the North Pine WTP. The location of the transition zone is dictated by production volumes from North Pine WTP. 40megalitres per day is supplied to Aspley but not much		

A85

Grid region	Demand zone	Supply option	Status	Key considerations	Trigger to implement option	Comment
				further, 100 megalitres per day improves the water quality in the Aspley to Sparkes Hill scheme		
Moreton Bay	LinkWater Pine Rivers Zone	Blend: North Pine WTP and NPI (NPI south)	Current			
Moreton Bay	LinkWater Pine Rivers Zone	Blend: Mt Crosby and North Pine WTPs (NPI north)	Option			
Moreton Bay	LinkWater Pine Rivers Zone	Blend: Mt Crosby and NPI south – North Pine turned off	Option	Water quality in raw water in North Pine Dam, especially the presence of Blue Green algae		
Moreton Bay	LinkWater Redcliffe Zone	Blend: North Pine WTP and NPI	Current	For disinfection purposes one supply is better than having some from the Petrie WTP and some from the North Pine WTP		
Moreton Bay	LinkWater Redcliffe Zone	Blend: North Pine & Petrie WTPs and NPI	Option	Water from the North Pine WTP is chloraminated. At Margate the water then only needs to be boosted with the same disinfection type		
Moreton Bay	LinkWater Redcliffe Zone	Blend: Mt Crosby WTP & NPI	Option	Likelihood of North Pine receiving inflow to Lake Kurwongbah		
Moreton Bay	LinkWater Redcliffe Zone	Petrie WTP Only	Option	Chlorinated supply going all the way to Redcliffe to get chloraminated at Margate. UnityWater have previously experienced problems under this mode		
	Western Corridor Recycled Water Scheme			When key Water Grid storages are below 40% of capacity, supply to Wivenhoe Dam is maximised		
	Southern Regional Water Pipeline	Northerly flow – maximum rate	Option		A water quality incident in Brisbane or asset related failure at Mt Crosby WTP would result in this option being implemented. For an aesthetic issue, water would be sourced from Molendinar and Mudgeeraba as a preference to the Gold Coast Desalination Plant	
	Southern Regional Water Pipeline	Northerly flow-- minimum rate	Current	Costs of operating the SRWP drive the Water Grid Manager to minimise the use of this pipeline		
	Southern Regional Water Pipeline	Southerly Flow – maximum rate	Option	Water quality and asset failure risk necessitate keeping the pipeline available.	Should Hinze Dam reach 40% and sufficient water be stored in Central Brisbane Dams. This would be coordinated with production from the Gold Coast Desalination Plant which may or may not be operating at greater than one-third capacity (depending on regional storage volumes)	
	Southern Regional Water Pipeline	Southerly Flow minimum rate	Option			
	Northern Pipeline Interconnector	Southerly flow supplying to Morayfield and Narangba and on to North Pine	Current	Levels in Sunshine Coast Dams relative to Brisbane Dams		
	Northern Pipeline Interconnector	Southerly flow at minimum rate supplying to Morayfield and part of Narangba's demand with North Pine WTP supplying north to Narangba	Option	Costs associated with production at Caboolture and North Pine cf Landers Shute and the NPI.	If Sunshine Coast Dams reach 70% or they are less full than Wivenhoe, Somerset and North Pine Dams (as a proportion)	
	Northern Pipeline Interconnector	Southerly flow maximum volume	Option	WQ risks at Landers Shute WTP particularly in summer.	Water quality incident to be managed in Brisbane or the southern part of Unitywater's area of responsibility	

A86

Grid region	Demand zone	Supply option	Status	Key considerations	Trigger to implement option	Comment
	Gold Coast Desalination Plant	Offline	Option			
	Gold Coast Desalination Plant	33% production	Current			
	Gold Coast Desalination Plant	66% production	Option		Regional storage volumes fall to 40% of capacity. If further testing of desalination plants capability was required these options would be considered	
	Gold Coast Desalination Plant	100% production	Option		Regional storage volumes fall to 40% of capacity. If further testing of desalination plants capability was required these options would be considered	

A87

Attachment 4: Operating Strategy requirements – Seqwater

Water Treatment Plant	Forecast supply requirement (ML/d averaged over a month)		Capacity requirement (ML/d)	Additional water quality requirements	Reliability requirements	Comments
	Mean Day Minimum Month	Mean Day Maximum Month				
Landers Shute WTP	66.6	98.3	130.0	TBD	TBD	
North Pine WTP	63.1	142.7	220.0	TBD	TBD	
Mt Crosby	279.2	486.4	900.0	TBD	TBD	
North Stradbroke Island WTP	26.0	26.0	26.0	TBD	TBD	
Capalaba WTP	5.7	30.1	18.0	TBD	TBD	
Molendinar WTP	25.4	160.9	160.0	TBD	TBD	
Mudgeeraba	47.9	99.6	100.0	TBD	TBD	
Noosa WTP	16.9	24.5	35.0	TBD	TBD	
Image Flat WTP	16.2	23.1	18.0	TBD	TBD	
Kenilworth WTP	0.3	0.3	0.4	TBD	TBD	
Ewen Maddock WTP	7.9	7.9	20.0	TBD	TBD	Require availability over summer to assist in managing potential risks associated with raw water quality pressures at Landers Shute WTP

Water Treatment Plant	Forecast supply requirement (ML/d averaged over a month)		Capacity requirement (ML/d)	Additional water quality requirements	Reliability requirements	Comments
	Mean Day Minimum Month	Mean Day Maximum Month				
Maleny WTP	0.0	0.0	0.0	TBD	TBD	Once Landers Shute to Maleny pipeline is proven, then the pipeline will be the source of supply.
Caboolture WTP	0.0	4.5	14.3	TBD	TBD	
Woorim WTP (Bribie Island)	0.0	0.0	0.0	TBD	TBD	
Banksia Beach WTP (Bribie Island)	0.0	4.2	4.2	TBD	TBD	
Brisbane Aquifer Project WTP	0.0	0.0	0.0	TBD	TBD	Ongoing requirement to maintain skills and knowledge in operating these plants to be discussed further with Seqwater.
Petrie WTP	11.3	27.1	45.0	TBD	TBD	
Woodford WTP	2.5	4.3	3.2	TBD	TBD	
Dayboro WTP	0.3	0.6	1.1	TBD	TBD	
Pt Lookout WTP	0.5	1.1	1.7	TBD	TBD	
Dunwich WTP	0.3	0.7	1.0	TBD	TBD	
Amity Point WTP	0.2	0.5	0.5	TBD	TBD	
Enoggera WTP	2.5	2.5	3.3	TBD	TBD	
Jimna WTP	0.0	0.0	0.9	TBD	TBD	
Kilcoy WTP	1.5	3.1	1.5	TBD	TBD	

Water Treatment Plant	Forecast supply requirement (ML/d averaged over a month)		Capacity requirement (ML/d)	Additional water quality requirements	Reliability requirements	Comments
	Mean Day Minimum Month	Mean Day Maximum Month				
Somerset Dam WTP (Esk)	0.0	0.1	0.5	TBD	TBD	
Esk WTP	0.5	1.1	0.8	TBD	TBD	
Linville WTP	0.0	0.1	0.7	TBD	TBD	
Lowood WTP	7.8	14.2	20.0	TBD	TBD	
South Maclean Weir WTP	1.9	5.5	6.5	TBD	TBD	
Kooralbyn WTP	0.5	1.5	1.9	TBD	TBD	
Rathdowney WTP	0.1	0.3	2.0	TBD	TBD	
Beaudesert WTP	1.6	5.4	4.8	TBD	TBD	
Albert River WTP	0.0	0.0	0.0	TBD	TBD	
Canungra WTP	0.2	0.8	0.4	TBD	TBD	
Aratula WTP	0.0	0.0	0.0	TBD	TBD	
Toogoolawah WTP	0.0	0.0	0.0	TBD	TBD	
Boonah-Kalbar WTP	2	6	3.5	TBD	TBD	

Note: Preliminary capacity requirements are included in this version of the Operating Strategy for discussion with Grid Service Providers. In particular the implications and opportunities associated with the statement of capacity requirements in this way is to be discussed prior to the submission of forthcoming Operating Strategy documents.

TBD – To be developed. These tables include placeholders for water quality and reliability/resilience considerations that will be developed in consultation with Grid Service providers over time.

Attachment 5: Operating Strategy requirements – LinkWater

Table A5.1: Interconnector requirements

Pipeline	Likely minimum requirement (ML/d)	Likely maximum requirement (ML/d)	Capacity requirement (ML/d)	Reliability requirement (ML/d)
Northern Pipeline Interconnector – Southerly flow	30	65	65	TBD
Southern Regional Water Pipeline – Northerly flow	25	95	95	TBD
Southern Regional Water Pipeline – Southerly flow	20	55	55	TBD
Eastern Pipeline Interconnector – Westerly flow	4	10	10	TBD
Eastern Pipeline Interconnector – Easterly flow	4	10	10	TBD

Table A5.2: Required take from major water treatment plants (megalitres per month)

Water treatment plant	Likely minimum requirement based on low demand scenario and operational requirements	Likely maximum requirement based on high demand scenario and operational requirements
Landers Shute	930	2,015
Molendinar	2,112	3,697
Mudgeeraba	1,621	3,088
Gold Coast Desalination Plant	1,279	3,875
Mt Crosby	8,492	15,077
North Pine	2,096	4,423
Capalaba	423	934
North Stradbroke Island	806	806

Note: Preliminary capacity requirements are included in this version of the Operating Strategy for discussion with Grid Service Providers. In particular the implications and opportunities associated with the statement of capacity requirements in this way is to be discussed prior to the submission of forthcoming Operating Strategy documents.

TBD – To be developed. These tables include placeholders for water quality and reliability/resilience considerations that will be developed in consultation with Grid Service providers over time.

Attachment 6: Operating Strategy requirements – WaterSecure

Table A6.1: Manufactured water requirements

Scheme	Mean Day Minimum month (ML/m (month))	Mean Day Maximum Month (ML/m)	Capacity requirement (ML/m)	Reliability requirement
Western Corridor Recycled Water Project	665	1,127	1,130	TBD
Gold Coast Desalination Plant	1,279	1,279	3,875	TBD

Note: Preliminary capacity requirements are included in this version of the Operating Strategy for discussion with Grid Service Providers. In particular the implications and opportunities associated with the statement of capacity requirements in this way is to be discussed prior to the submission of forthcoming Operating Strategy documents.

TBD – To be developed. These tables include placeholders for water quality and reliability/resilience considerations that will be developed in consultation with Grid Service providers over time.

Attachment 7: SEQ Water Balance Model inputs.

Table A7.1: Transfers used in short-term modelling

Transfer Rules	Storages	Trigger	Above trigger capacity (ML/d)	Below trigger capacity (ML/d)	Difference formula	Minimum difference	Qualifications
SRWP southerly flow	Southern Regional	40%	0	80	Southern minus Central	0	Trigger chosen at a point to ensure Hinze Dam does not reach minimum operating level (dead storage) which is one of the long term level of service objectives that the Water Grid Manager must ensure are met. This capacity has been increased from previous capacities used to incorporate the Logan River connection between the Logan Central area and Beenleigh/Gold Coast area. In practice the actual point below 50% at which the direction and volume of water transferred will be altered will be determined by regional and Gold Coast storage volumes, local demand and availability of the Gold Coast Desalination Plant at the time of decision. Southerly flow in the SRWP will be instigated earlier than this trigger should a water quality or asset failure related incident occur at the WTPs on the Gold Coast and or the Gold Coast Desalination Plant. This operational approach is subject to further cost information becoming available to allow comparison between northern and southern flow in the SRWP. Actual volume of transfer north will depend on demands and availability of WTPs on the Gold Coast.
SRWP northerly flow	Southern Regional	40%	29	0	Central minus Southern	0	SRWP direction is assumed to be north bound for the large majority of the period of the Operating Strategy. This however may be affected by cost and any unplanned incidents at the Gold Coast Plants (WTPs and Desalination Plant) that may necessitate southerly flow.
NPI southerly flow	Northern Regional	70%	65	0	Central minus Northern	0	Based on maximising supply into the Caboolture area and minimising the extent to which NPI contributes to North Pine WTP flow. Flow south may be increased above this level should there be a need for water quality or asset related issues.
NPI northerly flow	Northern Regional	0	0	0	Northern minus Central	0	Northerly flow in the NPI will not be available over the duration of this Operating Strategy; however it was factored into the assessment at the point it becomes available to ensure all the long term level of service criteria can be met. In this way we can test the operation over the next 12 months to ensure it does not jeopardise the security outcomes past this point once NPI 2 is complete with northerly flow capacity to Caloundra. Without the NPI northerly flow capacity built into the model at the stage of completion the long term level of service objective related to dead storage never being reached in Baroon Pocket could not be met.
Brisbane to Toowoomba	Toowoomba	100%	0	10000	NA		Below 100% in Toowoomba's Dams flow to Cressbrook Creek Dam can continue in accordance with model objectives. Over 20% in Toowoomba's dams it is likely that the transfer will not be as high as 10000 megalitres per annum as Toowoomba would be looking to minimise operating costs associated with this pipeline
Toowoomba to Brisbane	Toowoomba	0	0	0	NA		No transfer from Toowoomba to Wivenhoe envisaged

Table A7.2: Demands and Inflows used in short-term modelling

	Toowoomba Borefield	Bribie Borefield	Gold Coast Desalination Plant*	WCRWS**	Qualifications
Demand					See attached Model file
Annual inflow					Provided in model files attached to Operating Strategy
Monthly inflow (water year)					
1		120	3,802	3,802	*Desalination production 5% above 60% in key Water Grid Storages to reflect hot standby mode and 100% below 60% in key Water Grid Storages (as per trigger in table above).
2		120	3,802	3,802	** WCRWS trigger for augmenting drinking water supply is 40% of the regional storage volumes
3		120	3,802	3,802	
4		120	3,802	3,802	
5		120	3,802	3,802	
6		120	3,802	3,802	
7		120	3,802	3,802	
8		120	3,802	3,802	
9		120	3,802	3,802	
10		120	3,802	3,802	
11		120	3,802	3,802	
12		120	3,802	3,802	

Table A7.3: Transfers used in long-term modelling

Transfer Rules	Storages	Trigger	Above trigger capacity (ML/d)	Below trigger capacity (ML/d)	Difference formula	Minimum difference	Qualifications
SRWP southerly flow	Southern Regional	50 (of southern storages)	0	80	Southern minus Central	0	Trigger chosen at a point to ensure Hinze Dam does not reach minimum operating level (dead storage) which is one of the long term level of service objectives that the Water Grid Manager must ensure are met. This capacity has been increased from previous capacities used to incorporate the Logan River connection between the Logan Central area and Beenleigh/Gold Coast area. In practice the actual point below 50% at which the direction and volume of water transferred will be altered will be determined by regional and Gold Coast storage volumes, local demand and availability of the Gold Coast Desalination Plant at the time of decision. Southerly flow in the SRWP will be instigated earlier than this trigger should a water quality or asset failure related incident occur at the WTPs on the Gold Coast and or the Gold Coast Desalination Plant. This operational approach is subject to further cost information becoming available to allow comparison between northern and southern flow in the SRWP. Actual volume of transfer north will depend on demands and availability of WTPs on the Gold Coast.
SRWP northerly flow	Southern Regional	50 (of southern storages)	25	0	Central minus Southern	0	SRWP direction is assumed to be north bound for the large majority of the period of the Operating Strategy. This however may be affected by cost and any unplanned incidents at the Gold Coast Plants (WTPs and Desalination Plant) that may necessitate southerly flow.
NPI southerly flow	Northern Regional	70 (of northern region storages)	65	0	Central minus Northern	0	Based on maximising supply into the Caboolture area and minimising the extent to which NPI contributes to North Pine WTP flow. Flow south may be increased above this level should there be a need for water quality or asset related issues.
NPI northerly flow	Northern Regional	0	0	0	Northern minus Central	0	Northerly flow in the NPI will not be available over the duration of this Operating Strategy; however it was factored into the assessment at the point it becomes available to ensure all the long term level of service criteria can be met. In this way we can test the operation over the next 12 months to ensure it does not jeopardise the security outcomes past this point once NPI 2 is complete with northerly flow capacity to Caloundra. Without the NPI northerly flow capacity built into the model at the stage of completion the long term level of service objective related to dead storage never being reached in Baroon Pocket could not be met.
Brisbane to Toowoomba	Toowoomba	100	0	10000	NA		Below 100% in Toowoomba's Dams flow to Cressbrook Creek Dam can continue in accordance with model objectives. Over 20% in Toowoomba's dams it is likely that the transfer will not be as high as 10000 megalitres per annum as Toowoomba would be looking to minimise operating costs associated with this pipeline
Toowoomba to Brisbane	Toowoomba	0	0	0	NA		No transfer from Toowoomba to Wivenhoe envisaged
Gold Coast Desalination Plant		60% (of key grid storages)	44	125	NA		

Table A7.4: Demands and Inflows used in long-term modelling

	Toowoomba Borefield	Bribie Borefield	Gold Coast Desalination Plant*	WCRWS**	Qualifications
Demand					See attached Model file
Annual inflow					Provided in model files attached to Operating Strategy
Monthly inflow (water year)					
1		120	3,802	3,802	*Desalination production 5% above 60% in key Water Grid Storages to reflect hot standby mode and 100% below 60% in key Water Grid Storages (as per trigger in table above).
2		120	3,802	3,802	** WCRWS trigger for augmenting drinking water supply is 40% of the regional storage volumes
3		120	3,802	3,802	
4		120	3,802	3,802	
5		120	3,802	3,802	
6		120	3,802	3,802	
7		120	3,802	3,802	
8		120	3,802	3,802	
9		120	3,802	3,802	
10		120	3,802	3,802	
11		120	3,802	3,802	
12		120	3,802	3,802	

Attachment 8: SEQ Regional Water Balance Model outputs

Table A8.1: System Operating Plan risk criteria (low demand scenario, short-term model)

Volume of water stored by all Key Water Grid Storages	1 year		3 years		5 years	
	System Operating Plan	Operating Strategy	System Operating Plan	Operating Strategy	System Operating Plan	Operating Strategy
40%	< 0.2%	<0.01	NA	NA	<5%	0.03%
30%	NA	NA	< 0.5%	<0.01	<1%	<0.01

Table A8.2: System Operating Plan risk criteria (high demand scenario, short-term model)

Volume of water stored by all Key Water Grid Storages	1 year		3 years		5 years	
	System Operating Plan	Operating Strategy	System Operating Plan	Operating Strategy	System Operating Plan	Operating Strategy
40%	< 0.2%	<0.01	NA	NA	<5%	0.40%
30%	NA	NA	< 0.5%	<0.01	<1%	0.01%

Table A8.3: Levels of Service objectives (long-term model)

Criteria	System Operating Plan	Operating Strategy (low demand scenario)	Operating Strategy (high demand scenario)
T1	25	1,581	115
T2	100	No value returned	1,285
South East Queensland 10%	1,000	No value returned	No value returned
South East Queensland 5%	NA	No value returned	No value returned
Grid Three dead storage volume	NA	No value returned	No value returned
Baroon Pocket Dam dead storage volume	NA	No value returned	No value returned
Hinze Dam dead storage volume	NA	No value returned	No value returned

Attachment 9: Future assessments and decisions points

There are a range of issues that need to be resolved to ensure the efficient and effective operation of the Water Grid.

Some of these issues relate to asset utilisation, and will be driven by the asset owner. Specific issues are the:

- Brisbane Aquifer Project
- Woorim Water Treatment Plant
- Aratula Water Treatment Plant
- Toogoolawah Water Treatment Plant
- Albert River Water Treatment Plant.

None of these plants are required for drinking supply within the next five year period. Short-term issues relate to the potential use of the existing plant for uses other than drinking supply. Long-term issues relate to the capital works required to recommence supply to the Water Grid.

These last three water treatment plants listed in the dot points above are decommissioned plants that will not be required to treat water, at least within the timeframe of the Operating Strategy. There is some final assessment work required to be undertaken with Seqwater to determine what state they are currently in and what role they should have in the future, if any.

There is a second group of issues, for which there is a clear need for all relevant parties to be involved in a collaborative planning process, including the Water Grid Manager, Grid Service Providers and Grid Customers. The Water Grid Manager is already leading investigations of some of these issues, as listed in Section 5.6 including in relation to central Logan area and supply options for the Petrie area.

It is envisaged that future versions of the Operating Strategy will reflect any agreed decisions on these issues.

Listed below are the proposed areas and asset groupings that require further investigation to determine the optimal operating philosophy, along with key issues within them.

Northern South East Queensland: Sunshine Coast

Detailed review of potential operating modes for the following water treatment plants:

- Noosa
- Image Flat
- Ewen Maddock.

Other issues to be considered in developing an optimal Operating Strategy for this area include:

- operation of the Northern Pipeline Interconnector Stage 2, including maintenance of minimum flows and triggers for changed direction of flow
- potential supply to the Maroochy system from the Northern Pipeline Interconnector
- review of maximum available operating capacity of Landers Shute Water Treatment Plant.

These investigations need to be undertaken in collaboration with Unitywater, as well as relevant Grid Service Providers.

Northern South East Queensland: Moreton Bay

Detailed review of potential operating modes for the following Water Treatment Plants:

- Petrie
- Woorim
- Dayboro
- Banksia Beach
- Caboolture
- Woodford.

Other issues to be considered in developing an optimal Operating Strategy for this area include:

- delivery of level of service security and suitable water quality to Dayboro Water Treatment Plant, including options to construct pipeline from Petrie (in partnership with the Commission)
- options for meeting growth in the area supplied by Petrie Water Treatment Plant, including consideration of disinfection regimes
- supply to Bribie Island Water Treatment Plant, including reliability risks associated with the single pipe crossing of Pumicestone Passage and the time at which the capacity of that connection is reached and Bribie Island is effectively reliant on the sources on the island
- options to supply Woodford Water Treatment Plant, including the future role of the existing water treatment plant and pumped assets.

These investigations need to be undertaken in collaboration with Unitywater, as well as relevant Grid Service Providers.

Central South East Queensland

Detailed review of potential operating modes for the following water treatment plants:

- Mt Crosby West Bank
- Enoggera
- North Pine.

These investigations need to be undertaken in collaboration with Queensland Urban Utilities, as well as relevant Grid Service Providers.

Eastern South East Queensland

Detailed review of potential operating modes for the following facilities:

- Capalaba
- North Stradbroke Island
- Eastern Pipeline Interconnector.

Other issues to be considered in developing an optimal Operating Strategy for this area include specific risks faced at North Stradbroke WTP, including access in times of asset failure.

These investigations need to be undertaken in collaboration with Queensland Urban Utilities, as well as relevant Grid Service Providers.

Southern South East Queensland

Detailed review of potential operating modes for the Mudgeeraba Water Treatment Plant, including alternative supply options to areas that can currently only be supplied from here.

Other issues to be considered in developing an optimal Operating Strategy for this area include:

- the Southern Regional Water Pipeline operation for mitigation of water quality issues in Brisbane
- the Southern Regional Water Pipeline operation to supply the South MacLean area via the Teviot Road connection, taking into account the outcomes of the Commission's current investigations.
- the minimum production requirements from Mudgeeraba Water Treatment Plant (some areas can only be supplied from Mudgeeraba Water Treatment Plant).

Western South East Queensland

The Commission are coordinating broader investigations on water infrastructure for the Scenic Rim area in collaboration with Grid Participants and the Water Grid Manager. This will guide the medium and long term water planning outcomes for this area. However in the short term there is an urgent need to investigate the options for increasing supply to Canungra.

The Water Grid Manager is working closely with Seqwater and QUU to determine demands in Canungra and supply options with the view to implementing a solution in the short term while remaining cognisant of the broader planning work being coordinated by the Commission.

Attachment 10: Production and Transfer Forecast for 2011–2012 Financial Year

Seqwater – Connected to LinkWater

Water treatment Plant	Jul–11	Aug–11	Sep–11	Oct–11	Nov–11	Dec–11	Jan–12	Feb–12	Mar–12	Apr–12	May–12	Jun–12	Supply source	Total production (ML) July 2011 to June 2012
Landers Shute WTP	2114	2160	2241	2355	2331	2451	2473	2215	2355	2226	2193	2072	Baroon Pocket Dam	27187
North Pine WTP	1259	1317	2445	2586	2725	2891	2903	2627	2680	2516	2555	2393	North Pine Dam	28897
Mt Crosby	9042	9315	7977	8447	8252	7927	7721	7325	7703	8134	8231	7713	Wivenhoe/Somerset	97787
North Stradbroke Island WTP	631	659	707	758	741	799	806	722	774	743	707	646	Herring Lagoon/Ground water bores	8693
Capalaba WTP	372	372	360	360	360	372	372	336	341	330	341	330	Leslie Harrison Dam	4246
Molendinar WTP	2899	3532	3823	3951	3868	3979	3531	3332	3654	3077	3833	3609	Hinze/Little Nerang	43088
Mudgeeraba	1714	1743	1774	1840	1798	2050	1890	1705	1901	1820	1777	1672	Hinze/Little Nerang	21684
													Hinze Little Nerang total	

Seqwater Connected to Distribution Authority

Water treatment Plant	Jul–11Jul-11	Aug–11	Sep–11	Oct–11	Nov–11	Dec–11	Jan–12	Feb–12	Mar–12	Apr–12	May–12	Jun–12	Supply source	Total production (ML) July 2011 to June 2012
Noosa WTP	440	463	490	525	527	569	562	490	507	482	464	428	Lake McDonald/Borumba	5947
Image Flat WTP	446	460	472	500	499	529	535	494	518	486	470	439	Cooloolabin, Wappa Dam	5849
Kenilworth WTP	6	6	6	6	6	7	7	6	7	6	6	6	Kenilworth River Well	75
Ewen Maddock WTP	246	246	238	246	238	246	246	222	246	238	246	238	Ewen Maddock Dam	2896
Maleny WTP	0	0	0	0	0	0	0	0	0	0	0	0	Maleny Weir	0
Caboolture WTP	124	124	120	124	0	0	0	115	124	120	124	120	Caboolture Weir	1095
Woorim WTP (Bribie Island)	0	0	0	0	0	0	0	0	0	0	0	0	Bribie Island Borefield and Trench	0
Banksia Beach WTP (Bribie Island)	93	93	90	93	0	0	0	86	93	90	93	90	Bribie Island Borefields	821
Brisbane Aquifer Project WTP	0	0	0	0	0	0	0	0	0	0	0	0	Brisbane Aquifers	0

A103

Petrie WTP	514	525	517	540	521	534	531	498	532	513	528	506	Lake Kurwongbah 7000/North Pine 59000ML/a	6258
Woodford WTP	77	79	78	81	78	0	0	0	78	77	79	76	Stanley River Weir	704
Dayboro WTP	11	11	11	11	11	11	11	10	11	10	11	10	Dayboro Well Field	128
Pt Lookout WTP	17	16	20	19	23	27	30	17	17	20	16	14	Point Lookout Bores	236
Dunwich WTP	11	13	14	13	14	19	17	13	12	12	12	12	Dunwich Bores	162
Amity Point WTP	6	7	9	8	9	10	10	6	5	8	7	12	Amity Point Bores	97
Enoggera WTP	0	0	0	0	0	0	0	0	0	90	90	90	Enoggera Dam	270
Jimna WTP	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	Jimna Weir	7
Kilcoy WTP	37	40	42	47	46	48	48	46	48	43	42	37	Kilcoy Creek Weir	524
Somerset Dam WTP (Esk)	1	1	1	1	1	1	1	1	1	1	1	1	Wivenhoe/Somerset	12
Esk WTP	16	16	16	16	16	16	16	16	16	16	16	16	Wivenhoe/Somerset	192
Linville WTP	1	1	1	1	1	1	1	1	1	1	1	1	Linville Bores	9
Lowood WTP	208	208	208	208	208	208	208	208	208	208	208	208	Wivenhoe/Somerset	2490
South Maclean Weir WTP	59	58	59	60	58	64	65	55	59	59	58	56	Logan River	711
Kooralbyn WTP	14	14	14	14	14	14	14	14	14	14	14	14	Lake Maroon/Logan River	168
Rathdowney WTP	2	2	2	2	2	2	2	2	2	2	2	2	Lake Maroon/Logan River	24
Beaudesert WTP	50	50	50	50	50	51	51	51	51	51	51	50	Lake Maroon/Logan River	606
Canungra WTP	8	8	8	8	8	8	8	8	8	8	8	8	Canungra Creek	96
Boonah-Kalbar WTP	49	51	53	55	54	57	57	50	54	53	51	48	Moogerah Dam	632

WaterSecure Estimated Production Volumes

Scheme	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Supply source
Western Corridor Recycled Water Project Low Demand Scenario	505	505	450	505	490	505	505	470	505	365	375	365	Luggage Pt, Gibson Is and Bundamba AWTP
Western Corridor Recycled Water Project High Demand Scenario	1218	1218	1140	1218	1180	1218	1218	1137	1218	1055	1088	1055	Luggage Pt, Gibson Is and Bundamba AWTP
South East Queensland Tugun Desalination Plant	1018	439	175	200	175	716	1747	1571	1571	1005	200	200	Tugun
Total Low Purified Recycled Water (PRW) Demand Scenario	**1523**	944	**625**	**705**	665	**1221**	**2252**	2041	2076	1370	**575**	**565**	
Total High PRW Demand Scenario	**2236**	**1657**	**1315**	**1418**	**1355**	**1934**	**2965**	2708	2789	2060	**1288**	**1255**	

LinkWater Interconnector Pipelines

Pipeline	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12
NPI – South (ML/m)	868	868	900	930	900	930	930	784	868	840	868	840
NPI – South (ML/d)	28	28	30	30	30	30	30	28	28	28	28	28
SRWP – North (ML/m)	899	899	870	899	870	1395	1705	1680	1860	870	899	870
SRWP – North (ML/d)	29	29	29	29	29	45	55	60	60	29	29	29
SRWP – South (ML/m)	0	0	0	0	0	0	0	0	0	0	0	0
SRWP – South (ML/d)	0	0	0	0	0	0	0	0	0	0	0	0
EPI – West (ML/m)	124	124	120	124	120	124	124	112	124	120	124	120
EPI – West (ML/d)	4	4	4	4	4	4	4	4	4	4	4	4
EPI – East (ML/m)	0	0	0	0	0	0	0	0	0	0	0	0
EPI – East (ML/d)	0	0	0	0	0	0	0	0	0	0	0	0

A105

LinkWater Water Treatment Plant Volumes to Transfer												
Water treatment plant	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12
Landers Shute	868	868	900	930	900	930	930	784	868	840	868	840
Molendinar	2327	2888	3170	3273	3206	3269	2807	2679	2955	2408	3177	2991
Mudgeeraba	1714	1743	1774	1840	1798	2050	1890	1705	1901	1820	1777	1672
South East Queensland Desalination Plant	1018	439	175	200	175	716	1747	1571	1571	1005	200	200
Mt Crosby	9042	9315	7977	8447	8252	7927	7721	7325	7703	8134	8231	7713
North Pine	1259	1317	2445	2586	2725	2891	2903	2627	2680	2516	2555	2393
Capalaba	372	372	360	360	360	372	372	336	341	330	341	330
North Stradbroke Island	631	659	707	758	741	799	806	722	774	743	707	646
Total	**17231**	**17601**	**17509**	**18394**	**18157**	**18954**	**19176**	**17750**	**18793**	17796	**17855**	16786

Note: These volumes are based on a range of assumptions including those underpinning demand and operational philosophy and are an indicative forecast based on predicted water usage developed under the low demand scenario presented in this Operating Strategy.

The following table outlines the Grid Customer demand volumes used in preparing the production and transfer estimates above.

Estimated Grid Customer Demand Volume														
	Demand Zone	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Demand (ML) Jul 2011 to Jun 2012
Sunshine Coast Regional Council	Noosa WTP Zone	440	463	490	525	527	569	562	490	507	482	464	428	5947
	Maroochy Town – Image Flat WTP Zone	446	460	472	500	499	529	535	494	518	486	470	439	5849
	Maroochy – Landers Shute Zone	740	763	783	829	828	876	887	819	859	805	779	729	9697
	Maroochy – Kenilworth Zone	6	6	6	6	6	7	7	6	7	6	6	6	75
	Caloundra – Landers Shute Zone (Coastal)	548	565	580	614	613	649	657	607	637	597	577	540	7184
	Caloundra – Ewen Maddock Zone	191	197	202	214	213	226	229	211	222	208	201	188	2500
	Caloundra – Maleny Zone	13	14	14	15	15	16	16	15	16	15	14	13	176
Subtotal		**2385**	**2467**	**2547**	**2703**	**2702**	**2872**	**2893**	**2643**	**2765**	**2599**	**2510**	**2342**	**31429**
Moreton Bay Regional Council	Caboolture WTP Zone	124	124	120	124	0	0	0	115	124	120	124	120	1095
	Bribie Island Zone	93	93	90	93	0	0	0	86	93	90	93	90	821
	Woodford Zone	77	79	78	81	78	0	0	0	78	77	79	76	704

A106

	Dayboro Zone	11	11	11	11	11	11	11	10	11	10	11	10	128
	Petrie Zone	514	525	517	540	521	534	531	498	532	513	528	506	6258
	LinkWater Zone (Caboolture)	629	648	641	671	857	959	955	693	660	634	651	623	8621
	LinkWater zone (Pine Rivers)	490	501	493	514	496	509	506	474	507	489	503	482	5962
	LinkWater zone (Redcliffe)	253	258	254	265	256	262	261	245	261	252	259	249	3074
Subtotal		**2191**	**2238**	**2203**	**2299**	**2218**	**2275**	**2264**	**2121**	**2265**	**2185**	**2248**	**2156**	**26663**
	Enoggera Zone	0	0	0	0	0	0	0	0	0	90	90	90	270
Brisbane City Council	Brisbane Aquifer Project	0	0	0	0	0	0	0	0	0	0	0	0	0
	LinkWater Zone (Brisbane)	8398	8647	8512	8983	8767	8962	9070	8692	9218	8616	8738	8174	104776
Subtotal		**8398**	**8647**	**8512**	**8983**	**8767**	**8962**	**9070**	**8692**	**9218**	**8706**	**8828**	**8264**	**105046**
Ipswich City Council	LinkWater Zone (Ipswich)	1278	1343	1271	1382	1374	1326	1322	1345	1440	1333	1403	1320	16137
Subtotal		**1278**	**1343**	**1271**	**1382**	**1374**	**1326**	**1322**	**1345**	**1440**	**1333**	**1403**	**1320**	**16137**
Logan City Council	South Maclean Weir WTP	59	58	59	60	58	64	65	55	59	59	58	56	711
	LinkWater Zone (Logan)	1021	1003	1022	1047	997	1125	1144	967	1025	1036	999	969	12356
	Beenleigh	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gold Coast Zone – Logan Bridge	62	62	60	62	60	62	62	56	62	60	62	60	730
	Underwood Road connection from Brisbane City Council	0	0	0	0	0	0	0	0	0	0	0	0	0
	Logan SRWP Connection Teviot Road	124	112	124	120	124	120	124	124	120	124	120	124	1460
Subtotal		**1266**	**1235**	**1265**	**1289**	**1239**	**1371**	**1395**	**1203**	**1266**	**1280**	**1239**	**1210**	**15257**
Redland City Council	LinkWater Zone (North Stradbroke)	598	617	644	676	667	712	717	644	674	648	628	583	7809
	LinkWater Zone (Capalaba)	281	290	303	318	314	335	337	303	317	305	295	274	3670
	Dunwich Zone	11	13	14	13	14	19	17	13	12	12	12	12	162
	Amity Point Zone	6	7	9	8	9	10	10	6	5	8	7	12	97
	Point Lookout Zone	17	16	20	19	23	27	30	17	17	20	16	14	236
Subtotal		**913**	**943**	**990**	**1034**	**1027**	**1103**	**1111**	**982**	**1025**	**993**	**959**	**894**	**11974**
Somerset Regional Council	Kilcoy Zone	37	40	42	47	46	48	48	46	48	43	42	37	524

A107

	Lake Somerset Zone (Kilcoy)	0	0	0	0	0	0	0	0	0	0	0	0	0
	Esk/Toogoolawah Zone	16	16	16	16	16	16	16	16	16	16	16	16	192
	Linville Zone	1	1	1	1	1	1	1	1	1	1	1	1	9
	Somerset Town Zone (at Dam)	1	1	1	1	1	1	1	1	1	1	1	1	12
	Lowood/Fernvale Zone	37	37	37	37	37	37	37	37	37	37	37	37	444
	Tarampa/Minden Zone	8	8	8	8	8	8	8	8	8	8	8	8	90
	Jimna Zone	0	1	1	1	1	1	1	1	1	1	1	0	7
Subtotal		**99**	**103**	**105**	**110**	**109**	**111**	**111**	**109**	**111**	106	**104**	100	**1278**
Lockyer Valley Regional Council	Lowood Zone	163	163	163	163	163	163	163	163	163	163	163	163	1956
Subtotal		**163**	**163**	**163**	**163**	**163**	**163**	**163**	**163**	**163**	**163**	**163**	**163**	**1956**
CS Energy		350	350	300	350	340	350	350	325	350	215	220	215	3715
TEC Low Demand Scenario		155	155	150	155	150	155	155	145	155	150	155	150	1830
TEC High Demand Scenario		620	620	600	620	600	620	620	580	620	600	620	600	7320
	Kooralbyn Zone	14	14	14	14	14	14	14	14	14	14	14	14	168
	Rathdowney Zone	2	2	2	2	2	2	2	2	2	2	2	2	24
Scenic Rim Regional Council	Helen Street Zone	50	50	50	50	50	51	51	51	51	51	51	50	606
	Canungra Zone	8	8	8	8	8	8	8	8	8	8	8	8	96
	Boonah-Kalbar WTP Zone	49	51	53	55	54	57	57	50	54	53	51	48	632
	Peak Crossing Zone (Ipswich)	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal		**123**	**125**	**127**	**129**	**128**	**132**	**132**	**125**	**129**	**128**	**126**	**122**	**1526**
	Southport West	572	582	593	616	602	648	662	597	638	609	594	557	7270
Gold Coast City Council	LinkWater Zone (Northern Mixed)	2464	2508	2555	2654	2591	2790	2849	2570	2746	2623	2558	2401	31309
	LinkWater Zone (Mudgeeraba)	871	887	903	938	916	986	1007	909	971	927	904	849	11067
	LinkWater Zone (Southern Mixed)	763	777	791	822	802	864	882	796	850	812	792	744	9697
Subtotal		**4670**	**4754**	**4842**	**5030**	**4911**	**5288**	**5400**	**4872**	**5205**	**4972**	**4849**	**4551**	**59343**

A108

	Brisbane PRW	248	248	240	248	240	248	248	232	248	240	248	240	2928
Total annual Demand		**22859**	**23391**	**23315**	**24495**	**23967**	**24975**	**25235**	**23537**	**24960**	**23669**	**23672**	**22326**	**286402**

A109

Our ref: D/11/011066

15 APR 2011

Queensland water Commission

Securing our water, together

Mr [redacted]
Chair
South East Queensland Water Grid Manager
PO Box 16205
City East QLD 4002

Dear Mr [redacted]

Proposed Operating Strategy (March 2011)

Thank you for your letter of 11 March 2011, concerning the South East Queensland (SEQ) Water Grid Manager's submission of a proposed Operating Strategy dated February 2011, in accordance with the SEQ System Operating Plan (SOP).

The Queensland Water Commission has assessed your submission and has approved the proposed Operating Strategy received on 11 March 2011 subject to the conditions in Attachment A. Please note that this Operating Strategy should be dated March 2011 (not February 2011). This approval takes effect from 15 April 2011 and will continue in force until such time as the approval is revised or replaced.

The Commission appreciates the opportunity to discuss and clarify various matters with your officers in relation to the assessment of the proposed Operating Strategy. I have also included some items in Attachment B for your consideration in the next submission of the proposed Operating Strategy. To facilitate the process, I suggest your officers meet with the Commission's officers to discuss matters in relation to Attachments A and B prior to your next submission.

In addition, the Commission would like to work with the Water Grid Manager to jointly enhance a shared approach to the evolution of the role of the Operating Strategy in achieving outcomes of the SOP. This work could be ongoing and would inform the Operating Strategy due in November 2011.

However, as required under the SOP, the next proposed Operating Strategy will need to be submitted to the Commission by 31 May 2011.

If you require any further information, please contact [redacted] Acting General Manager, Regional Planning and Policy on [redacted]

Yours sincerely

[redacted]

Mary Boydell
Commissioner

Enc (2)

Queensland Water Commission
PO Box 15087 City East Qld 4002
Ph: +61 7 3227 8207 Fax: +61 7 3227 8227
ABN: 65 242 908 036 web: www.qwc.qld.gov.au

Attachment A

Conditions of approval for the SEQ Water Grid Manager's Proposed Operating Strategy (submitted on 11 March 2011)

(Please note that words in italics refer to Commission's comments only and do not form part of the conditions)

1. Cover page

Delete February and insert March.

2. Footer of every page

Delete February and insert March.

3. Page 5, Section 1.0 Introduction

Delete the following sentence:

Through these means, the Operating Strategy is expected to inform the operation and regulation of Grid Service Providers.

(Comment: The proposed Operating Strategy does not provide an authority for the SEQWGM to regulate the Grid Service Providers.)

4. Page 6, Section 1.1, paragraph 1

Replace the following paragraph:

The Operating Strategy is one of a series of integrated plans that provide the strategic operating framework for the Water Grid. These plans are made under a number of regulations and market instruments.

By

This Operating Strategy under the SOP is informed by other plans made under a number of regulations and market instruments.

(Comment: The Operating Strategy is one document that deals with the operation for the next 12 months.)

5. Page 11, Section 2.3 Other Regulatory Requirements

Delete the following paragraph:

The Operating Strategy also:

- provides the basis for determination of forecast volumes as required by Market Rules

- must be consistent with any approved Drinking Water Quality Management Plan or Recycled Water Quality Management Plan, both for the Water Grid as a whole and for individual assets.

(Comment: The importance and purpose of this section to the operating strategy is unclear. The Commission also notes that the plans mentioned above have been stated elsewhere within the submission.)

6. Page 12, Last paragraph

Replace paragraph by:

The maximum volume of water the Water Grid Manager may enter into contracts to sell is 450,000 megalitres per annum in the current version of the System Operating Plan.

(Comment: There is no need for the other information.)

7. Page 18, First paragraph

Delete paragraph:

Future versions of the Operating Strategy are expected to specify reliability targets for the Water Grid and key assets within it, based on the reliability assessment and the requirements outlined in any Customer Code.

(Comment: Delete for the purpose of this Operating strategy as the intent needs to be further discussed.)

8. Page 20, 3rd paragraph

Replace paragraph:

Options are assessed as a portfolio, taking into account the costs and timeframes to bring capacity online as dam levels decline. Capital deferral options will be a key driver, due to the magnitude of potential savings, and reflected in advice sought from the Water Grid Manager by the Minister for Energy and Water Utilities about the need for capital projects with an estimated total cost of greater than $2 million.

By:

Options are assessed as a portfolio, taking into account the costs and timeframes to bring capacity online as dam levels decline. Capital deferral options will be a key driver due to the magnitude of potential savings.

(Comment: Not necessary to be included in this Operating Strategy.)

9. Page 32, Other Demand Assessments

Replace the words medium demand scenario with high demand scenario.

(Comment: To be consistent with the demand scenarios stated in other sections of the proposed Operating Strategy.)

10. Page 33, Supply to areas outside South East Queensland

Delete the following paragraph:

As a conservative measure, it has been assumed for the modelling that water will be taken at the contracted rate at all times when Toowoomba storages are at less than 100% of combined capacity. The model assumes that water is not taken at times when the Toowoomba storages are spilling and will also be driven by relative storage levels between Toowoomba storages are spilling and will also be driven by relative storage levels between Toowoomba Storages and Wivenhoe Dam. This assumption may be reviewed once demands are more certain.

(Comment: The current and intended operations for this version of the operating strategy have been detailed in the first paragraph. For this version of the operating strategy the model set up reflects the current operations and this has been discussed with the SEQWGM)

11. Page 33, Last paragraph, Supply to areas outside South East Queensland

Replace paragraph:

Opportunities to supply water to other areas outside South East Queensland are being investigated, for possible inclusion in future versions of the Operating Strategy.

By:
Opportunities to supply water to other areas outside South East Queensland are being investigated. Any such supply would need to be taken into account in future versions of the Operating Strategy.

(Comment: Better reflects the intent of the Operating Strategy.)

12. Page 40, Section 5.1, second bullet point

Replace the words <u>at least</u> 30 ML/d with <u>up to</u> 30 ML/d

(Comment: This change reflects the intended operation as per discussions with the SEQWGM)

13. Page 43, Operations of the Western Corridor Recycled Water Scheme, 4th bullet point

Delete the following paragraph:

Water Secure prepare and implement a Readiness Risk Management Plan to ensure that the WCRWS is available to augment Wivenhoe Dam immediately upon key water Grid storages falling to 40 percent of combined capacity, with oversight as proposed by the Commission.

(Comment: This requirement is not applicable for this operating strategy and will be discussed in the future with key stakeholders).

14. Pages 66 and 67, section 6.1, Level of Service Objective and Risk Criteria

Delete Tables 9 and Table 10.

(Comment: Section 6 refers to System Operating Plan Compliance. SEQWGM advice was that the results presented in Tables 9 and 10 were based on scenario runs).

15. Page 68, Operating Rules, 8.2 Water Security Rule, 2nd bullet point

Delete the following paragraph:

A Readiness Risk Management Plan will be prepared and implemented to ensure that the Western Corridor Recycled Water Scheme is available to augment Wivenhoe Dam immediately upon key water Grid Storages falling to 40% of combined capacity, with oversight as proposed by the Commission.

(Comment: This requirement is not applicable for this operating strategy and will be discussed in the future with key stakeholders).

16. Page 95, Attachment 7, Table A7.1, SEQ Water Balance Model Input

Delete last row which refers to the Gold Coast Desalination Plant.

(Comment: This table refers to transfer rates and not production capacity).

Attachment B: Summary of items for consideration in the next proposed Operating Strategy submission

1. SEQ Water Balance Model

In reviewing the proposed Operating Strategy submission, it was recognised that there is a need to provide further clarity on model input data provided by the SEQWGM. A meeting will be organised to progress this matter. It is envisaged that these discussions between the Commission and the SEQWGM will address inconsistencies identified in model input data and future submissions of the proposed Operating Strategy.

2. Consultation

The Commission notes the Schedule of Engagement and Discussion Points provided by the SEQWGM to the Commission to demonstrate consultation has occurred with the key entities. For future submissions, it is recommended that a concise summary of feedback from the key entities (Seqwater, Link Water and WaterSecure) be included in the proposed Operating Strategy within the section on Consultation.

It is intended that the above approach will further promote collaboration in the preparation of the proposed Operating Strategy, in addition to informing the Commission that the approach for consultation meets its intended purpose under the SOP in the preparation of the proposed Operating Strategy.

3. Page 22, Water Quality

The SEQ Water Grid Quality Management Plan should be the paramount document to manage water quality, not the Operating Strategy. This needs to be further discussed.

4. Page 99, Attachment 8 and section 6.1 contains the same information

It is considered that results on Risk Criteria and Desired Level of Service Objectives be provided in one place in future submissions to avoid potential inconsistencies.

5. Pages 100, 101 and 102 (Attachment 9)

Require further discussion to clarify relevance of details provided for some of the items for the period that the operation strategy will be applicable.

6. Section 5 of proposed Operating Strategy and Attachment 7

Require further discussions to ensure consistency between Section 5 (Operating Strategy) with Model Input data stated in Attachment 7.

7. General

There needs to be a deliberate considered approach to ensure that the Operating Strategy does not inadvertently be assumed to manage risk that could arguably reside with the Grid Service Providers e.g. staff impacts and organisational knowledge (on Page 13) and industrial relations and workforce planning (Other Considerations on Page 18).

[redacted]

From: Reilly Bob [redacted]
Sent: Thursday, 14 October 2010 2:21 PM
To: [redacted] Peter Borrows; Dan Spiller
Cc: Allen Peter
Subject: Protocol on flooding

Hi [redacted], Peter

See email chain below

I will give Bruce Grady a ring and get the ball rolling on the protocol

Regards

Bob

Bob Reilly
General Manager, Office of the Water Supply Regulator
Telephone: [redacted]
Email: [redacted]
www.derm.qld.gov.au

Department of Environment and Resource Management
Lvl 3 41 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: Reilly Bob
Sent: Thursday, 14 October 2010 2:16 PM
To: [redacted]
Cc: [redacted] Bradley John; Wall Terry; [redacted]
Subject: RE: Prem

Hi everyone

The Minister also raised the desirability of the protocol.

I am happy to get work underway—but should it focus on the flooding issue or have a wider focus—see [redacted] email below.

Thanks

Bob

Bob Reilly
General Manager, Office of the Water Supply Regulator
Telephone: [redacted]
Email: [redacted]
www.derm.qld.gov.au

Department of Environment and Resource Management

Lvl 3 41 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: [redacted]
Sent: Thursday, 14 October 2010 1:50 PM
To: [redacted]; Reilly Bob
Cc: [redacted]; Bradley John; Wall Terry; [redacted]
Subject: RE: Prem

Most appropriate contact for the development of the protocol is Bob Reilly (and Peter Allen) - he attended this morning's meeting referred to below in Ken's email and also right now with Minister Robertson and the water entities, on basis of his role as dam safety regulator.

[redacted]
Deputy Director-General
Water and Corporate Services
Telephone: [redacted]
Mobile: 04[redacted]
Email: [redacted]
www.derm.qld.gov.au

Department of Environment and Resource Management
Level 13, 400 George Street, Brisbane QLD 4000
GPO Box 2454, Brisbane QLD 4001

Please note I have recently moved offices to 400 George Street.

From: [redacted]
Sent: Thursday, 14 October 2010 1:41 PM
To: [redacted]
Cc: [redacted]; Bradley John
Subject: FW: Prem

Hi [redacted]

[redacted]h took a call from Bruce on this a few minutes ago.

For the moment Bruce has WEO as the immediate contacts until we advise the most appropriate contact

Ta
[redacted]

From: Ken Smith [redacted]
Sent: Thursday, 14 October 2010 1:14 PM
To: [redacted]; Nicole Scurrah; [redacted]
Cc: Bradley John; [redacted]; 'Bruce Grady'
Subject: RE: Prem

Yes of course. I will get John Bradley and [redacted] to work with the water authorities to finalise, based on an assessment of this and previous incidents.

John...Can you work with DCS, more specifically EMQ's Bruce Grady on protocol which should specifically cover the incident we have been dealing with on SEQ Water/Council. Might also cover or relate to other disaster related incidents.

Happy to discuss.

Regards

Ken Smith
Director-General
Department of the Premier and Cabinet

Phone: [redacted]
Mobile: [redacted]
Email: [redacted]

Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au

Please consider the environment before printing this email (3 sheets of paper = 1 litre of water)

From: [redacted]
Sent: Thursday, 14 October 2010 1:08 PM
To: Ken Smith; Nicole Scurrah; Chris Taylor
Subject: Prem

Prem was quoted on radio saying there needed to be a protocol...can we action?

From: Ken Smith [redacted]
Sent: Thursday, 14 October 2010 12:55 PM
To: Nicole Scurrah; [redacted]
Subject: FW: Brisbane River Flood Models

See confirmation of results from the technical meeting this morning, involving BCC, SEQ Water and BOM.

Regards

Ken Smith
Director-General
Department of the Premier and Cabinet

Phone [redacted]
Mobile [redacted]
Email [redacted]

Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au

Please consider the environment before printing this email (3 sheets of paper = 1 litre of water)

From: Peter Borrows [redacted]
Sent: Thursday, 14 October 2010 12:29 PM
To: Ken Smith; Dennien Barry; Reilly Bob; Allen Peter
Subject: Brisbane River Flood Models

FYI

Regards, Peter.

Peter Borrows
Chief Executive Officer
Queensland Bulk Water Supply Authority *trading as* Seqwater

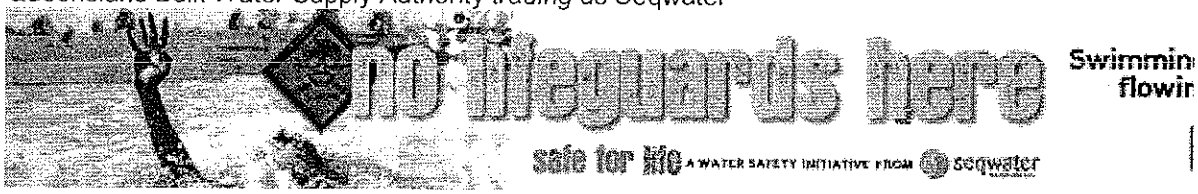
Ph (07) [redacted] E [redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

From: Rob Drury
Sent: Thursday, 14 October 2010 12:25 PM
To: Peter Borrows
Subject: FW: Discussions from this morning

Peter,
Comments as per this morning.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

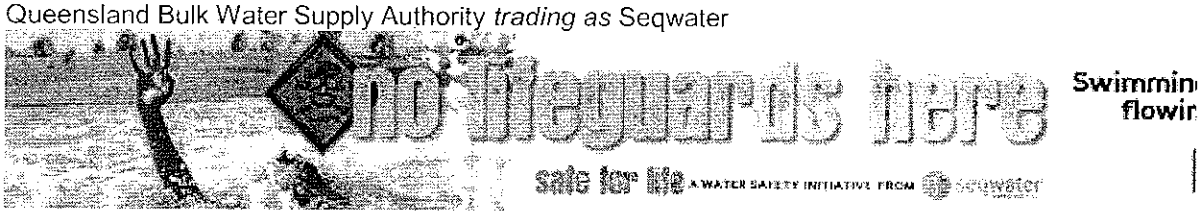
From: Rob Drury
Sent: Thursday, 14 October 2010 11:42 AM
To: [redacted]
Cc: 'ken.morris[redacted]; 'james.charalambous[redacted]
Subject: Discussions from this morning

As we discussed this morning, we agreed on the following points

- Brisbane City Council, Seqwater and the Bureau of Meteorology do not have any disagreement on the technical assessment of river levels or models to determine those levels
- Results of those assessments do not show that there should be any flooding in the Brisbane area however Brisbane City Council have undertaken precautionary actions to ensure procedures are in place in case of any unexpected impacts
- BCC, Seqwater and the BoM are continuing sharing of data and information and will continually improve this for future events.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater





[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email is intended only for the addressee. Its use is limited to that intended by the author at the time and it is not to be distributed without the author's consent.

Unless otherwise stated, the State of Queensland accepts no liability for the contents of this email except where subsequently confirmed in writing. The opinions expressed in this email are those of the author and do not necessarily represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.

This email is intended only for the addressee. Its use is limited to that intended by the author at the time and it is not
to be distributed without the author's consent.

Unless otherwise stated, the State of Queensland accepts no liability for the contents of this email except where
subsequently confirmed in writing. The opinions expressed in this email are those of the author and do not necessarily
represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

[redacted]

From: Reilly Bob [redacted]
Sent: Thursday, 14 October 2010 3:55 PM
To: [redacted] Peter Borrows; Barry Dennien
Cc: Allen Peter; [redacted]; Dan Spiller
Subject: Friday Meeting on flood advice protocol

H[redacted] Peter, Barry

This is to confirm that the meeting will commence at 8 am tomorrow (Friday) in the large conference room at Level 3 Mineral House. The meeting will go from 8 am to 10am.

[redacted]—as discussed could you please arrange for appropriate representation from Emergency Service, BOM, and other Qld Govt agencies. I will arrange for representation from the Grid Manager and Seqwater

Peter, Barry—As discussed, could you please arrange representation from your organisations.

Please note that the Council(s) will not be present at this meeting. I would like for us to define what we think the scope and issues should be first, before we involve Council(s). Arrangements are being made to contact BCC today to ascertain their views on the protocol.

Thanks

Bob

Bob Reilly

General Manager, Office of the Water Supply Regulator

[redacted]

www.derm.qld.gov.au

Department of Environment and Resource Management

Lvl 3 41 George Street, Brisbane Q 4000

GPO Box 2454, Brisbane Q 4001

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

[redacted]

From: Barry Dennien
Sent: Thursday, 14 October 2010 4:12 PM
To: Dan Spiller
Subject: FW: Friday Meeting on flood advice protocol

Can you come

From: Reilly Bob [redacted]
Sent: Thursday, 14 October 2010 3:55 PM
To: [redacted] Peter Borrows; Barry Dennien
Cc: Allen Peter; [redacted] Dan Spiller
Subject: Friday Meeting on flood advice protocol

Hi [redacted], Peter, Barry

This is to confirm that the meeting will commence at 8 am tomorrow (Friday) in the large conference room at Level 3 Mineral House. The meeting will go from 8 am to 10am.

[redacted]—as discussed could you please arrange for appropriate representation from Emergency Service, BOM, and other Qld Govt agencies. I will arrange for representation from the Grid Manager and Seqwater

Peter, Barry—As discussed, could you please arrange representation from your organisations.

Please note that the Council(s) will not be present at this meeting. I would like for us to define what we think the scope and issues should be first, before we involve Council(s). Arrangements are being made to contact BCC today to ascertain their views on the protocol.

Thanks

Bob

Bob Reilly

General Manager, Office of the Water Supply Regulator

[redacted]

www.derm.qld.gov.au

Department of Environment and Resource Management

Lvl 3 41 George Street, Brisbane Q 4000

GPO Box 2454, Brisbane Q 4001

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

[redacted]

From: Peter Borrows [redacted]
Sent: Thursday, 14 October 2010 4:20 PM
To: Reilly Bob [redacted]; Barry Dennien
Cc: Allen Peter; Dan Spiller
Subject: RE: Friday Meeting on flood advice protocol

Thanks Bob.

As discussed, Rob Drury and Mike Foster from Seqwater will be attending. Call me if necessary.

Regards, Peter.

Peter Borrows
Chief Executive Officer
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

From: Reilly Bob [redacted]
Sent: Thursday, 14 October 2010 3:55 PM
To: [redacted] Peter Borrows; Dennien Barry @ SEQWGM
Cc: Allen Peter [redacted] Spiller Daniel (SEQWGM)
Subject: Friday Meeting on flood advice protocol

H[redacted] Peter, Barry

This is to confirm that the meeting will commence at 8 am tomorrow (Friday) in the large conference room at Level 3 Mineral House. The meeting will go from 8 am to 10am.

[redacted]—as discussed could you please arrange for appropriate representation from Emergency Service, BOM, and other Qld Govt agencies. I will arrange for representation from the Grid Manager and Seqwater

Peter, Barry—As discussed, could you please arrange representation from your organisations.

Please note that the Council(s) will not be present at this meeting. I would like for us to define what we think the scope and issues should be first, before we involve Council(s). Arrangements are being made to contact BCC today to ascertain their views on the protocol.

Thanks

Bob

Bob Reilly

General Manager, Office of the Water Supply Regulator

Telephone: [redacted]

Email: [redacted]

www.derm.qld.gov.au

Department of Environment and Resource Management

Lvl 3 41 George Street, Brisbane Q 4000

GPO Box 2454, Brisbane Q 4001

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

sheets of A4 paper = 1 litre of water

+----------+

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Mike Foster [redacted]
Sent: Thursday, 14 October 2010 4:25 PM
To: Dan Spiller; [redacted]
Subject: FW: Friday Meeting on flood advice protocol

You gents coming along

We need to spend some more time together

From: Peter Borrows
Sent: Thursday, 14 October 2010 4:20 PM
To: Reilly Bob; [redacted] Dennien Barry @ SEQWGM
Cc: Allen Peter; [redacted] Spiller Daniel (SEQWGM)
Subject: RE: Friday Meeting on flood advice protocol

Thanks Bob.

As discussed, Rob Drury and Mike Foster from Seqwater will be attending. Call me if necessary.

Regards, Peter.

Peter Borrows
Chief Executive Officer
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

---

rom: Reilly Bob [redacted]
Sent: Thursday, 14 October 2010 3:55 PM
To [redacted] Peter Borrows; Dennien Barry @ SEQWGM
Cc: Allen Peter; [redacted] Spiller Daniel (SEQWGM)
Subject: Friday Meeting on flood advice protocol

Hi [redacted] Peter, Barry

This is to confirm that the meeting will commence at 8 am tomorrow (Friday) in the large conference room at Level 3 Mineral House. The meeting will go from 8 am to 10am.

[redacted]—as discussed could you please arrange for appropriate representation from Emergency Service, BOM, and other Qld Govt agencies. I will arrange for representation from the Grid Manager and Seqwater

Peter, Barry—As discussed, could you please arrange representation from your organisations.

Please note that the Council(s) will not be present at this meeting. I would like for us to define what we think the scope and issues should be first, before we involve Council(s). Arrangements are being made to contact BCC today to ascertain their views on the protocol.

Thanks

Bob

Bob Reilly

General Manager, Office of the Water Supply Regulator

[redacted]

www.derm.qld.gov.au

Department of Environment and Resource Management

Lvl 3 41 George Street, Brisbane Q 4000

GPO Box 2454, Brisbane Q 4001

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Barry Dennien
Sent: Thursday, 14 October 2010 4:27 PM
To: ken.smith[redacted]
Cc: Dan Spiller
Subject: FW: Letter to Lord Mayor regarding possible flooding in Brisbane.docx
Attachments: Letter to Lord Mayor regarding possible flooding in Brisbane.docx

Some thoughts

From: Ken Smith[redacted]
Sent: Thursday, 14 October 2010 4:06 PM
To: Barry Dennien
Subject: FW: Letter to Lord Mayor regarding possible flooding in Brisbane.docx

Barry

Draft response for the Lord Mayor

.egards

Ken Smith
Director-General
Department of the Premier and Cabinet

[redacted]

Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au

Please consider the environment before printing this email (3 sheets of paper = 1 litre of water)

From[redacted]
Sent: Thursday, 14 October 2010 3:49 PM
To: Ken Smith
Cc:[redacted]
Subject: FW: Letter to Lord Mayor regarding possible flooding in Brisbane.docx

Ken

Draft letter to the Lord Mayor as discussed. Leave it with you.

[redacted]

Deputy Director-General | Governance | Department of the Premier and Cabinet
[redacted]
Level 4, Executive Building, 100 George Street, BRISBANE QLD 4000

Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au
Please consider the environment before printing this email

From: [redacted]
Sent: Thursday, 14 October 2010 3:04 PM
To: [redacted]
Subject: Letter to Lord Mayor regarding possible flooding in Brisbane.docx

H[redacted]

Please find attached your letter to the Lord Mayor, as requested. If you need to further edit this letter, you'll find it in N:\govern_com\ddg_com\New File Structure\Deputy Director-General -[redacted]\Letters\2010

Cheers

[redacted]
A/Principal Executive Assistant
Office of the Deputy Director-General (Governance)
Department of the Premier and Cabinet
Level 4 | 100 George St
[redacted]

omorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au
Please consider the environment before printing this email

This email is intended only for the addressee. Its use is limited to that intended by the author at the time and it is not
to be distributed without the author's consent.

Unless otherwise stated, the State of Queensland accepts no liability for the contents of this email except where
subsequently confirmed in writing. The opinions expressed in this email are those of the author and do not necessarily
represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.

[redacted]

From: [redacted]
Sent: Thursday, 14 October 2010 5:33 PM
To: Dan Spiller
Cc: Mike Foster
Subject: Re: Friday Meeting on flood advice protocol

Yes I wouldn't miss it

Sent from my iPhone

On 14/10/2010, at 6:12 PM, "Dan Spiller" <[redacted] wrote:

> Over to [redacted] I am taking my bat and ball home – and doing some of my rather large backlog of work.

From: Mike Foster [[redacted]
Sent: Thursday, 14 October 2010 4:25 PM
To: Dan Spiller; [redacted]
Subject: FW: Friday Meeting on flood advice protocol

You gents coming along

We need to spend some more time together

From: Peter Borrows
Sent: Thursday, 14 October 2010 4:20 PM
To: Reilly Bob; [redacted] Dennien Barry @ SEQWGM
Cc: Allen Peter; [redacted] Spiller Daniel (SEQWGM)
Subject: RE: Friday Meeting on flood advice protocol

Thanks Bob.

As discussed, Rob Drury and Mike Foster from Seqwater will be attending. Call me if necessary.

Regards, Peter.

Peter Borrows

Chief Executive Officer

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.png>

[redacted]

Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002

Website | www.seqwater.com.au

From: Reilly Bob [redacted]
Sent: Thursday, 14 October 2010 3:55 PM
To: [redacted] Peter Borrows; Dennien Barry @ SEQWGM
Cc: Allen Peter; [redacted] Spiller Daniel (SEQWGM)
Subject: Friday Meeting on flood advice protocol

Hi [redacted], Peter, Barry

This is to confirm that the meeting will commence at 8 am tomorrow (Friday) in the large conference room at Level 3 Mineral House. The meeting will go from 8 am to 10am.

[redacted]—as discussed could you please arrange for appropriate representation from Emergency Service, BOM, and other Qld Govt agencies. I will arrange for representation from the Grid Manager and Seqwater

Peter, Barry—As discussed, could you please arrange representation from your organisations.

Please note that the Council(s) will not be present at this meeting. I would like for us to define what we think the scope and issues should be first, before we involve Council(s). Arrangements are being made to contact BCC today to ascertain their views on the protocol.

Thanks

Bob

Bob Reilly

General Manager, Office of the Water Supply Regulator

Telephone: [redacted]

Email: [redacted]

www.derm.qld.gov.au

Department of Environment and Resource Management

Lvl 3 41 George Street, Brisbane Q 4000

GPO Box 2454, Brisbane Q 4001

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

----------Safe Stamp----------
--
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Reilly Bob [redacted]
Sent: Thursday, 14 October 2010 6:44 PM
To: Dan Spiller
Subject: Fw: Letter to Lord Mayor regarding possible flooding in Brisbane.docx
Attachments: Letter to Lord Mayor regarding possible flooding in Brisbane.docx

Hi dan

could you please forward this to barry--my emails to him keep bouncing

Thanks

Bob

----- Original Message -----
From: Reilly Bob
To: [redacted]
'Barry.Dennien [redacted]
Cc: Allen Peter
Sent: Thu Oct 14 17:52:14 2010
Subject: Fw: Letter to Lord Mayor regarding possible flooding in Brisbane.docx

Fyi--please note this is only a draft at this time

Bob

----- Original Message -----
From: [redacted]
To: Reilly Bob
Sent: Thu Oct 14 16:56:47 2010
Subject: FW: Letter to Lord Mayor regarding possible flooding in Brisbane.docx

Bob,
Draft letter attached

From: [redacted]
Sent: Thursday, 14 October 2010 4:23 PM
To: [redacted]
Subject: FW: Letter to Lord Mayor regarding possible flooding in Brisbane.docx

Hi [redacted]

Please find attached for your information a copy of a letter that Ken asked Pat to draft re the flood/water release protocol.

Regards

[redacted]
Manager, Executive Support
Department of the Premier and Cabinet
[redacted]
Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au<file:///C:/Documents%20and%20Settings/Smithbr/Application%20Data/Microsoft/Signatures/www.towardQ2.qld.gov.au>

From: [redacted]
Sent: Thursday, 14 October 2010 3:57 PM
To [redacted]
Cc: [redacted]
Subject: FW: Letter to Lord Mayor regarding possible flooding in Brisbane.docx

[redacted]

FYI re a letter the Prem will send to LM on this matter.

[redacted]

Deputy Director-General | Governance | Department of the Premier and Cabinet
Phone: [redacted]
Executive Building, 100 George Street, BRISBANE QLD 4000

Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au
* Please consider the environment before printing this email

From: [redacted]
Sent: Thursday, 14 October 2010 3:49 PM
To: Ken Smith
Cc: [redacted]
Subject: FW: Letter to Lord Mayor regarding possible flooding in Brisbane.docx

Ken

Draft letter to the Lord Mayor as discussed. Leave it with you.

[redacted]

Deputy Director-General | Governance | Department of the Premier and Cabinet
[redacted] Level 4,
Executive Building, 100 George Street, BRISBANE QLD 4000

Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au
* Please consider the environment before printing this email

From: [redacted]
Sent: Thursday, 14 October 2010 3:04 PM
To: [redacted]
Subject: Letter to Lord Mayor regarding possible flooding in Brisbane.docx

[redacted]

Please find attached your letter to the Lord Mayor, as requested. If you need to further edit this letter, you'll find it in <N:\govern_com\ddg_com\New File Structure\Deputy Director-General - P Vidgen\Letters\2010>

Cheers

B20

[redacted]
A/Principal Executive Assistant
Office of the Deputy Director-General (Governance) Department of the Premier and Cabinet Level 4 | 100 George St
[redacted]

Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au Please consider the environment before printing this email

---

This email is intended only for the addressee. Its use is limited to that intended by the author at the time and it is not to be distributed without the author's consent.

Unless otherwise stated, the State of Queensland accepts no liability for the contents of this email except where subsequently confirmed in writing. The opinions expressed in this email are those of the author and do not necessarily represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.

+----------+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+----------+

B21

For reply please quote: *ODDGG/PV – TF/10/ - DOC/10/*

The Right Honourable Lord Mayor
Councillor Campbell Newman
Office of the Lord Mayor
GPO Box 2287
BRISBANE QLD 4001

Dear Campbell

I refer to recent advice to the Brisbane community in relation to the possible flooding impacts associated with the release of water from the Wivenhoe Dam.

Regrettably, when the community is in need of important information that effects their wellbeing, conflicting institutional advice, such as differential flood modelling by Seqwater~~EQ Water~~, the Bureau of Meteorology and the Brisbane City Council, is of great concern.

As you are aware, as we move to a La Nina weather pattern, there is likely to be significant rainfall across Queensland including southeast Queensland, over the summer months. This may be exacerbated by cyclones which have the potential to generate storm surges and disperse huge volumes of water in very short periods of time.

I therefore believe it is important to develop a Protocol between the Bureau of Meteorology, State Government and the Brisbane City Council to ensure a process for the development of consistent and robust information which the community will rely upon in times of such emergencies. For example, during major events, we could agree upon a process to issue joint media and community information, following consultation between our technical experts.

~~Accordingly,~~ I seek your urgent nomination of a senior officer to work with the Department of Community Safety (Emergency Management Queensland), the Department of Environment and Resource Management, Seqwater~~EQ Water~~, the Bureau of Meteorology and other water entities to develop and finalise the Protocol.

I expect this group to meet early next week and provide a draft Protocol for our consideration by the end of next week. Should you or your officers require further information, please contact Mr Ken Smith, Director-General, Department of the Premier and Cabinet on [redacted]

Yours sincerely

ANNA BLIGH MP
PREMIER OF QUEENSLAND

[redacted]

From: Barry Dennien
Sent: Thursday, 14 October 2010 4:46 PM
To: Dan Spiller; [redacted]
Subject: FW: Friday Meeting on flood advice protocol

From: Peter Borrows [redacted]
Sent: Thursday, 14 October 2010 4:20 PM
To: Reilly Bob; [redacted]; Barry Dennien
Cc: Allen Peter; [redacted]; Dan Spiller
Subject: RE: Friday Meeting on flood advice protocol

Thanks Bob.

As discussed, Rob Drury and Mike Foster from Seqwater will be attending. Call me if necessary.

Regards, Peter.

Peter Borrows
Chief Executive Officer
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

From: Reilly Bob [r[redacted]
Sent: Thursday, 14 October 2010 3:55 PM
To: [redacted] Peter Borrows; Dennien Barry @ SEQWGM
Cc: Allen Peter; [redacted]; Spiller Daniel (SEQWGM)
Subject: Friday Meeting on flood advice protocol

Hi [redacted] Peter, Barry

This is to confirm that the meeting will commence at 8 am tomorrow (Friday) in the large conference room at Level 3 Mineral House. The meeting will go from 8 am to 10am.

[redacted]—as discussed could you please arrange for appropriate representation from Emergency Service, BOM, and other Qld Govt agencies. I will arrange for representation from the Grid Manager and Seqwater

Peter, Barry—As discussed, could you please arrange representation from your organisations.

Please note that the Council(s) will not be present at this meeting. I would like for us to define what we think the scope and issues should be first, before we involve Council(s). Arrangements are being made to contact BCC today to ascertain their views on the protocol.

Thanks

Bob

Bob Reilly

General Manager, Office of the Water Supply Regulator

Telephone: [redacted]

Email: [redacted]

www.derm.qld.gov.au

Department of Environment and Resource Management

Lvl 3 41 George Street, Brisbane Q 4000

GPO Box 2454, Brisbane Q 4001

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Peter Borrows [redacted]
Sent: Thursday, 14 October 2010 4:20 PM
To: Reilly Bob; [redacted]; Barry Dennien
Cc: Allen Peter [redacted] Dan Spiller
Subject: RE: Friday Meeting on flood advice protocol

Thanks Bob.

As discussed, Rob Drury and Mike Foster from Seqwater will be attending. Call me if necessary.

Regards, Peter.

Peter Borrows
Chief Executive Officer
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

From: Reilly Bob [redacted]
Sent: Thursday, 14 October 2010 3:55 PM
To: [redacted] Peter Borrows; Dennien Barry @ 5EQWGM
Cc: Allen Peter; [redacted] Spiller Daniel (SEQWGM)
Subject: Friday Meeting on flood advice protocol

Hi [redacted] Peter, Barry

This is to confirm that the meeting will commence at 8 am tomorrow (Friday) in the large conference room at Level 3 Mineral House. The meeting will go from 8 am to 10am.

[redacted]—as discussed could you please arrange for appropriate representation from Emergency Service, BOM, and other Qld Govt agencies. I will arrange for representation from the Grid Manager and Seqwater

Peter, Barry—As discussed, could you please arrange representation from your organisations.

Please note that the Council(s) will not be present at this meeting. I would like for us to define what we think the scope and issues should be first, before we involve Council(s). Arrangements are being made to contact BCC today to ascertain their views on the protocol.

Thanks

Bob

Bob Reilly

General Manager, Office of the Water Supply Regulator

Telephone: [redacted]

Email: [redacted]

www.derm.qld.gov.au

Department of Environment and Resource Management

Lvl 3 41 George Street, Brisbane Q 4000

GPO Box 2454, Brisbane Q 4001

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: [redacted]
Sent: Thursday, 14 October 2010 5:33 PM
To: Dan Spiller
Cc: Mike Foster
Subject: Re: Friday Meeting on flood advice protocol

Yes I wouldn't miss it

Sent from my iPhone

On 14/10/2010, at 6:12 PM, "Dan Spiller" [redacted] wrote:

> Over to [redacted] I am taking my bat and ball home – and doing some of my rather large backlog of work.

From: Mike Foster [redacted]
Sent: Thursday, 14 October 2010 4:25 PM
To: Dan Spiller; [redacted]
Subject: FW: Friday Meeting on flood advice protocol

You gents coming along

We need to spend some more time together

From: Peter Borrows
Sent: Thursday, 14 October 2010 4:20 PM
To: Reilly Bob; [redacted] Dennien Barry @ SEQWGM
Cc: Allen Peter; [redacted] Spiller Daniel (SEQWGM)
Subject: RE: Friday Meeting on flood advice protocol

Thanks Bob.

As discussed, Rob Drury and Mike Foster from Seqwater will be attending. Call me if necessary.

Regards, Peter.

Peter Borrows

Chief Executive Officer

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.png>

[redacted]

Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002

Website | www.seqwater.com.au

From: Reilly Bob [redacted]
Sent: Thursday, 14 October 2010 3:55 PM
To: [redacted] Peter Borrows; Dennien Barry @ SEQWGM
Cc: Allen Peter; [redacted] Spiller Daniel (SEQWGM)
Subject: Friday Meeting on flood advice protocol

Hi [redacted] Peter, Barry

This is to confirm that the meeting will commence at 8 am tomorrow (Friday) in the large conference room at Level 3 Mineral House. The meeting will go from 8 am to 10am.

[redacted]—as discussed could you please arrange for appropriate representation from Emergency Service, BOM, and other Qld Govt agencies. I will arrange for representation from the Grid Manager and Seqwater

Peter, Barry—As discussed, could you please arrange representation from your organisations.

Please note that the Council(s) will not be present at this meeting. I would like for us to define what we think the scope and issues should be first, before we involve Council(s). Arrangements are being made to contact BCC today to ascertain their views on the protocol.

Thanks

Bob

Bob Reilly

General Manager, Office of the Water Supply Regulator

Telephone [redacted]

Email: [redacted]

www.derm.qld.gov.au

Department of Environment and Resource Management

Lvl 3 41 George Street, Brisbane Q 4000

GPO Box 2454, Brisbane Q 4001

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

----------Safe Stamp----------
--
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

For reply please quote: *ODDGG/PV – TF/10/ - DOC/10/*

The Right Honourable Lord Mayor
Councillor Campbell Newman
Office of the Lord Mayor
GPO Box 2287
BRISBANE QLD 4001

Dear Campbell

I refer to recent advice to the Brisbane community in relation to the possible flooding impacts associated with the release of water from the Wivenhoe Dam.

Regrettably, when the community is in need of important information that effects their wellbeing, conflicting institutional advice, such as differential flood modelling by SEQ Water, the Bureau of Meteorology and the Brisbane City Council, is of great concern.

As you are aware, as we move to a La Nina weather pattern, there is likely to be significant rainfall across Queensland including southeast Queensland, over the summer months. This may be exacerbated by cyclones which have the potential to disperse huge volumes of water in very short periods of time.

I therefore believe it is important to develop a Protocol between the State Government and the Brisbane City Council to ensure a process for the development of consistent and robust information which the community will rely upon in times of such emergencies. Accordingly, I seek your urgent nomination of a senior officer to work with the Department of Community Safety (Emergency Management Queensland), the Department of Environment and Resource Management, SEQ Water, the Bureau of Meteorology and other water entities to develop and finalise the Protocol.

I expect this group to meet early next week and provide a draft Protocol for our consideration by the end of next week. Should you or your officers require further information, please contact Mr Ken Smith, Director-General, Department of the Premier and Cabinet on [redacted]

Yours sincerely

ANNA BLIGH MP
PREMIER OF QUEENSLAND

Subject:	Flood Issues
Location:	telephone hook-up
Start:	Fri 15/10/2010 3:30 PM
End:	Fri 15/10/2010 4:00 PM
Recurrence:	(none)
Meeting Status:	Not yet responded
Organizer:	Bradley John

Attendees

John Bradley
Barry Dennien
Dan Spiller
Bob Reilly

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

[redacted]

From: Barry Dennien
Sent: Monday, 18 October 2010 8:20 AM
To: [redacted]
Cc: Dan Spiller; [redacted]
Subject: FW: Release of water from Wivenhoe Dam Protocol
Attachments: Release of water form Wivenhoe dam.doc

[redacted] we will meet this morning to discuss

From: [redacted]
Sent: Friday, 15 October 2010 4:36 PM
To: [redacted]
Cc: Barry Dennien; [redacted]
Subject: FW: Release of water from Wivenhoe Dam Protocol

[redacted]

've made some minor changes (as marked). We may have a few more minor tweaks r.e. communications – we are confirming them with the other entities in the SEQ Water Grid, and will have final feedback if required by next Tuesdays meeting. To preface the SEQ Water Grid Managers approach to this review:

1. We believe that there is a well designed and practiced Emergency Response Plan in place for the water entities in SEQ, and an equally well practised series of protocols in place for disaster planning and response at local and disaster district level. As such, we are keen to not create an additional layer of planning, but rather to:
    a. Clarify touch points
    b. Create visibility of the extant processes at the political leadership levels of State and Local Govt
2. That a tight 'left and right of arc' be maintained – specifically that this review is focused floodwater release from Wivenhoe Dam, and not a more general review of flooding response

I am comfortable that the above approach is being reflected in the revision processes undertaken to date.

Regards

[redacted]

[redacted]

Director Risk and Technology
SEQ Water Grid Manager

[redacted]

Post: PO Box 16205, BRISBANE CITY EAST, QLD 4002
Visit: Level 15, 53 Albert St, BRISBANE
ABN: 14783 317 630

From: [redacted]
Sent: Friday, 15 October 2010 1:35 PM
To: [redacted]; [redacted]
Subject: FW: Release of water from Wivenhoe Dam Protocol

Gentlemen

I'm re-sending the below email in case it did not go through.

Kind Regards

[redacted] A/Program Officer (SDCG, DDMG & LDMG) I Disaster Management Governance Unit I Emergency Management Queensland I Department of Community Safety I [redacted]
BRISBANE QLD 4001 I **State Disaster Management Group Email:** [redacted] **| State Disaster Coordination Group Email:** [redacted]**@dcs.qld.gov.au I Please consider the environment before printing this e-mail I**

From: [redacted]
Sent: Friday, 15 October 2010 13:10
To: 'b.dennien[redacted]
Subject: Release of water from Wivenhoe Dam Protocol

Good Afternoon Gentlemen

Further to the meeting this morning, please find attached the 'Release of water from Wivenhoe Dam' Protocol.

Please provide your comments and input by **1pm Monday 18 October 2010**.

Kind Regards

[redacted] A/Program Officer (SDCG, DDMG & LDMG) I Disaster Management Governance Unit I Emergency Management Queensland I Department of Community Safety I [redacted] I GPO Box 1425
BRISBANE QLD 4001 I **State Disaster Management Group Email:** [redacted]**@dcs.qld.gov.au | State Disaster Coordination Group Email** [redacted]**@dcs.qld.gov.au I Please consider the environment before printing this e-mail I**

This correspondence is for the named persons only. It may contain confidential or privileged information or both. No confidentiality or privilege is waived or lost by any mis transmission. If you receive this correspondence in error please delete it from your system immediately and notify the sender. You must not disclose, copy or relay on any part of this correspondence, if you are not the intended recipient. Any opinions expressed in this message are those of the individual sender except where the sender expressly, and with the authority, states them to be the opinions of the Department of Community Safety, Queensland.

All reasonable precautions will be taken to respect the privacy of individuals in accordance with the Information Privacy Act 2009 (Qld). Details on how personal information may be used or disclosed by the Department of Community Safety, Queensland are available from www.communitysafety.qld.gov.au/info/privacy.htm

Release of water from Wivenhoe Dam

A skeleton protocol

OBJECTIVE (DERM – Please comment)

The floodwater release strategy is a balance between releasing the water quickly enough so that the flood storage capacity is available if another major rain event occurs, versus minimising downstream flooding impacts (basically property damage and human safety) from the releases. The strategy is contained in a flood mitigation plan that is approved by the Department of Environment and Resource Management (DERM).

Comment [%1]: It may b

GENERAL DECISION MAKING - GUIDING PRINCIPLES (DPC - Please comment)

- Protection of public safety is paramount;
- Public inconvenience is a legitimate consideration of any risk assessment;
- Decision-making chains should remain flexible;
- Communications within government and to the public about agreed potential effects and decisions taken are essential;
- If the flood release strategies are followed, then the Queensland Government, rather than the dam owner, assumes legal liability for any consequences. (DERM – please comment)

ROLES AND RESPONSIBILITIES (possibly an Appendix)
(DERM, BoM, SEQ Water – Please comment)

- The Bureau of Meteorology (BoM) issues flood warnings including predicted river heights for Brisbane City, Ipswich, Jindalee and Moggill, in consultation with South East Queensland Water (SEQ Water) headworks operator, Brisbane City Council, Ipswich City Council and Somerset Regional Council, as required.
- South East Queensland Water (SEQ Water) informs BoM and other agencies on the status of dams, and actual and projected releases from Wivenhoe Dam. It consults BoM regarding expected flood heights along the Brisbane River downstream of Wivenhoe Dam.
- Brisbane City Council, Ipswich City Council and Somerset Regional Council distribute consistent, detailed flood level information, both to their respective operational units, and their broader communities. This should include the interpretation of river height forecasts into expected areas and depths of inundation.
- DERM ..... **(DERM - Please comment)**

PROCESS OF COMMUNICATION

Technical issues

Technical release is done through established SEQ Water manuals, in accordance with the *Water Supply (Safety and Reliability) Act 2008*. SEQ Water is obliged to follow detailed flood release strategies which are contained in the flood mitigation plan. A fundamental principle behind the plan is that all floodwater should be released from the dams within seven days. This ensures the dam can cope with another major rain event.

SEQ Water calculates the impact according to dam levels and predicted weather events, and approves the release in consultation with DERM. **(SEQ Water – please comment).**

The Bureau will assess and inform SEQ water and BCC about any weather events likely to cause a significant rise above reservoir level EL67.0 in the Wivenhoe Dam. **(BoM – please comment)**

SEQ Water will discuss and model implications of the necessary water release from Wivenhoe in accordance with the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam. **(SEQ Water – please comment)** Stakeholders in these discussions are:

- BCC
- DERM
- BoM

Technical agencies agree on modelling results and any impact on communities.

Approval strategy for individual releases is based on the levels in Wivenhoe and Somerset, and the discharges from downstream Lockyer Ck and Bremer River catchments. The aim is to limit total flows (including discharges from Wivenhoe) at Mt Crosby to less than 1900 cubic metres per second. Flood damage in Brisbane commences at a total flow around 4,000 cubic metres per second. **(DERM – please comment)**

Extreme Events (DERM, DPC, QPS – please comment)

If warranted by any release of water that will lead to significant public safety issues,

- SEQ Water Grid Mmanager will alert DG DCS and DG DERM
- DG DCS will alert the State Disaster Management Group and
- DG DERM will inform the Ministers for Natural Resources, Mines and Energy.
- Councils will activate their Local Disaster Management Groups (LDMGs).
- LDMGs will inform their District Disaster Coordinators (DDCs), who will take action as appropriate.

The State's Public information arrangement may then be activated.

Public communications issues (SEQ Water, BoM, DPC, DCS - please comment)

Following agreement, results passed to SEQ Water Grid Mmanager.

SEQ Water Grid Manager will confer with the following or their representatives over pubic safety messages

- BoM,
- DCS Media Director and
- BCC Media Director

The Bureau, SEQ Water and Local Governments are to meet via teleconferences, to ensure that conflicting predictions are not released to the public at any time. Where differences arise, officers of the agencies concemed will liaise and consult to ensure that the information released to the public by all agencies is consistent.

After confirmation, harmonised public communications messages will be released by:

- **SEQ Water Grid Manager;** concentrating on the technical aspects of release timings and duration of effects. SEQ WWater operational staff are to ensure that technical information is communicated to ~~SEQ Senior Management~~the SEQ Water Grid Emergency Response Team (if activated) and the SEQ Water Grid Communications Unit.

- **Bureau of Meteorology;** concentrating on flood warnings to agencies through established lines of communication.

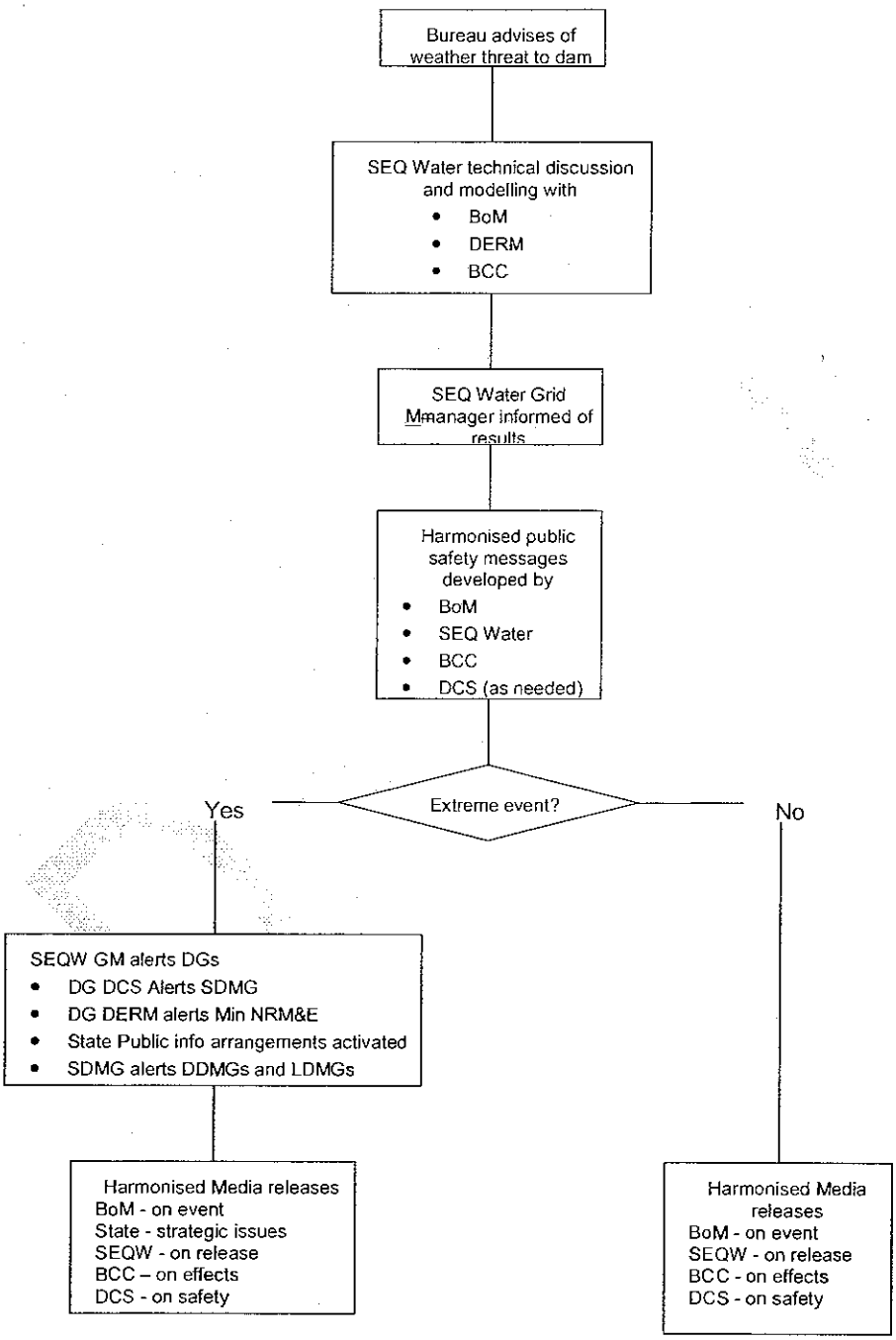
- **Local Governments / Local Disaster Management Groups;** concentrating on the effects of release and safety for residents.

- **Department of Community Safety;** on general safety matters regarding flooding if appropriate.

- **(Extreme events only) Department of Premier and Cabinet;** concentrate on uniting front and filtering consistent information to media and agencies concerned.

Questions from the Public (SEQ Water, DPC – please provide advice)

Release of water from Wivenhoe Dam



[redacted]

Subject:	Dam operating protocol
Location:	Barry Office
Start:	Mon 18/10/2010 9:30 AM
End:	Mon 18/10/2010 10:00 AM
Show Time As:	Tentative
Recurrence:	(none)
Meeting Status:	Not yet responded
Organizer:	Barry Dennien
Required Attendees:	[redacted] Dan Spiller

B39

[redacted]

From: [redacted]
Sent: Tuesday, 19 October 2010 11:52 AM
To: Barry Dennien; Dan Spiller; [redacted]
Subject: SITREP template for release from Wivenhoe
Attachments: SITREP template for release of water from Wivenhoe Dam.DOCX; SITREP template for release of water from Wivenhoe Dam.tr5

Importance: High

Gents

Pls see attached template. Pls make suggested changes prior to 2pm, so I can consolidated and return to EMQ by 3pm today as promised.

Cheers

[redacted]

Director Risk and Technology
SEQ Water Grid Manager
[redacted]
Post: PO Box 16205, BRISBANE CITY EAST, QLD 4002
Visit: Level 15, 53 Albert St, BRISBANE
ABN: 14783 317 630

Technical Situation Report

SITREP Number		Date of SITREP release		Time of SITREP release	

Issue of SITREPs

Next SITREP due	Date		Time	

Collated and distributed by

SEQ Water Grid Manager Contact Officer signature	
SEQ Water Grid Manager Contact Officer name	
SEQ Water Grid Manager Contact Officer position title	
SEQ Water Grid Manager contact details	

Part A – SEQWater assessment

(to include details of the current levels within the flood storage compartment and the agreed release strategy as governed under the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam)

SEQWater Contact Officer signature	
SEQWater Contact Officer name	
SEQWater Contact Officer position title	
Date and time of signature	

Part B – BoM assessment

(to include prediction of further inflows to Wivenhoe and Somerset Dams, and details of the predicted river heights and flood warnings for Brisbane City, Ipswich, Jindalee and Moggill based on natural events in combination with the agreed release strategy outlined in Part A)

BoM Contact Officer signature	
BoM Contact Officer name	
BoM Contact Officer position title	
Date and time of signature	

Part C – BCC assessment

(to include predicted inundation areas and depths of inundation based on the information outlined in Part B)

BCC Contact Officer signature	
BCC Contact Officer name	
BCC Contact Officer position title	
Date and time of signature	

Part D - ICC assessment (if required)

Part E - SRC assessment (if required)

(both part D and part E requirements are the same as part C)

[redacted]

From: Barry Dennien
Sent: Thursday, 21 October 2010 7:52 AM
To: Dan Spiller
Subject: FW: Protocol on release of water from Dams
Attachments: Protocol_Release of water from dams 20Oct.doc

fyi

From: [redacted]
Sent: Wednesday, 20 October 2010 5:45 PM
To: [redacted] mfoste[redacted] Barry Dennien; Reilly Bob; [redacted] Rob Drury; P.Baddiley[redacted] Barry Dennien; [redacted] peter.allen[redacted] Bruce Grady [redacted]
Subject: Protocol on release of water from Dams

Attached please find the latest draft.

Mike

Mike Shapland MBE | Director, Disaster Management
Emergency Management Queensland | Department of Community Safety
Level 3, Block E, Emergency Services Complex, Kedron, Queensland
[redacted]

This correspondence is for the named persons only. It may contain confidential or privileged information or both. No confidentiality or privilege is waived or lost by any mis transmission. If you receive this correspondence in error please delete it from your system immediately and notify the sender. You must not disclose, copy or relay on any part of this correspondence, if you are not the intended recipient. Any opinions expressed in this message are those of the individual sender except where the sender expressly, and with the authority, states them to be the opinions of the Department of Community Safety, Queensland.

All reasonable precautions will be taken to respect the privacy of individuals in accordance with the Information Privacy Act 2009 (Qld). Details on how personal information may be used or disclosed by the Department of Community Safety, Queensland are available from www.communitysafety.qld.gov.au/info/privacy.htm

Protocol for the Communication of Flooding Information from Releases - Wivenhoe and Somerset Dams

OBJECTIVE

The purpose of this protocol is to outline the processes to be followed by the Brisbane, Ipswich and Somerset Councils, relevant Queensland Government agencies, South East Queensland Water and the Bureau of Meteorology, which will ensure the provision of consistent and robust information to the community, concerning potential flooding impact during release of floodwater from Wivenhoe and Somerset Dams.

The intent is to ensure that consistent, harmonised information, based on an agreed single point of truth, is communicated to the public in a way that contributes to disaster resilient communities.

BACKGROUND

Wivenhoe Dam controls approximately half of the Brisbane River catchment above Brisbane City. Other factors such as storm surges, creek flooding, flooding from lower Brisbane River including Lockyer Creek and the Bremer River, will influence inundation levels in Brisbane.

The operational strategy for water release from Wivenhoe and Somerset Dams is governed by the *Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam*, henceforth referred to as the Flood Mitigation Manual.

The Flood Mitigation Manual is approved and gazetted by the Department of Environment and Resource Management (DERM), in accordance with the provisions of the *Water Supply (Safety and Reliability) Act 2008*.

The Flood Mitigation Manual was developed to ensure that operational decisions at Wivenhoe and Somerset Dams are based on sound engineering principles, which ascertain the structural safety of the dam while minimising downstream impacts.

In the event of a major impact on communities, Queensland disaster management arrangements, based on disaster management groups at local, district and state level, ensure the collaborative and effective coordination of information for all hazards.

Local, district and state disaster management and hazard-specific plans outline arrangements and structures for disaster management, or the hazard, and amongst other things, identify the need for coordination of public communications.

This protocol adds to such plans by outlining specific arrangements necessary when advice to the community needs to be based on technical assessments from hazard-specific primary agencies and other complementary stakeholders across federal, state and local governments.

GENERAL DECISION MAKING - GUIDING PRINCIPLES

- Protection of public safety is paramount throughout both the Flood Mitigation Manual and this Protocol;
- The Flood Mitigation Manual is used to determine how Wivenhoe and Somerset Dams will be operated during flood events;
- Impact on the community upstream or downstream is a legitimate consideration of any risk assessment;
- Agreed regular and consistent communications within government and to the public, in relation to the impacts of floodwater releases from Wivenhoe Dam, are essential;
- Decision-making chains regarding the communications strategy and disaster management should remain flexible;

PROCESS OF COMMUNICATION

There are three stages in the process of communication

- Monitoring and Assessment
- Briefing and Activation
- Public Communications

Monitoring and Assessment

The floodwater release strategy is a balance between releasing the water quickly enough so that the flood storage capacity is available if another major rain event occurs, versus minimising downstream flooding impacts (human safety and property damage) from the releases.

A fundamental principle is that all floodwater should be released from the dams within seven days of the flood event peaking in Wivenhoe or Somerset Dam. This ensures the dams can cope with closely spaced major rain events.

Communications with the public on floodwater releases are based on a continuous process of technical assessment. The process is dynamic and evolves according to the event, but will normally contain the following steps:

- Routine monitoring of weather events and dam levels by relevant agencies via established systems and procedures;

- The Bureau of Meteorology (Bom) provides weather forecasts and warnings (e.g. Tropical Cyclone, Severe Weather, Severe Thunderstorm, Flood). In the event of heavy rain and runoff in the Wivenhoe and/or Somerset Dam catchments, BoM and the Queensland Bulk Water Supply Authority (Seqwater) discuss modelled inflows to Wivenhoe and/or Somerset Dam, and downstream flood levels.

- Seqwater discusses and models implications of the necessary water release from Wivenhoe Dam and/or Somerset Dam.

- Seqwater calculates the releases according to dam levels and predicted weather events in accordance .with the Flood Mitigation Manual. Seqwater shares predicted floodwater releases with BoM and with the Councils.

- BoM undertakes modelling of the Brisbane River catchment and its river systems using Seqwater advice of actual and projected Wivenhoe Dam and/or

Somerset Dam releases when these are, or are expected, to occur.

- BoM participates in technical discussions with Seqwater, Brisbane City Council, Ipswich City Council and Somerset Regional Council as necessary, to share modelling results. The discussions aim to establish an agreement on what to tell the public about predicted flood levels and timings in Flood Warning.

- Councils identify flood inundation areas and assess impacts for their communities and regularly share this information with all relevant parties.

- Following a decision to release floodwater, or a change in the severity and scope of the event, Seqwater coordinates the completion of the *Flood Release Operations and Impact Report* (FROIR - Appendix C) and provides the report to the SEQ Water Grid Manager according to their Emergency Response Plan, in order to start the public communications process.

If, during this continuous process, there is an agreement between BoM, local governments and Seqwater that the situation is likely to result in significant public safety issues, the SEQ Water Grid Manager will commence briefing and engage with the disaster management arrangements as appropriate.

Briefing and Activation

Once the FROIR has been issued, consideration will be given to the activation of the Disaster Management arrangements.

1. SEQ Water Grid Manager will alert the Director-General (DG) of the Department of Community Safety (DCS), DG DERM, and the local governments;

2. DG DCS will inform the DG of the Department of Premier and Cabinet (DPC) - the Chair of the State Disaster Management Group (SDMG), and will activate the State Disaster Coordination Centre (SDCC). DG DCS will also inform the Minister for Police, Corrective Services and Emergency Services;

3. Councils will consider activating their Local Disaster Management Groups (LDMGs);

4. The SDCC and LDMGs will inform the relevant District Disaster Coordinators (DDCs);

5. The Queensland Police Service (QPS) will consider initiating disaster management actions as provided for under the *Disaster Management Act 2003*;

6. DG DERM will inform the Minister for Natural Resources, Mines and Energy;

7. DG DPC will inform the Premier;

8. In the case of an extreme event, the Crisis Communications Network, chaired by the Department of Premier and Cabinet (DPC), may be activated at the direction of the SDMG Chair to coordinate public messaging agreed by BoM, Seqwater, SEQ Water Grid Manager, QPS, relevant Councils and DCS as per this protocol;

9. In the case of a non-disaster, public communications will be in accordance with this protocol.

Public Communications Issues

SEQ Water Grid Communications Unit will coordinate the input and liaise with the following or their representatives over pubic safety messages:

- BoM;
- Seqwater;
- Councils' Media Directors.
- QPS Media Director; and
- DCS Media Director.

The BoM, Seqwater and Local Governments are to maintain continual discussions, to ensure that conflicting predictions are not released to the public at any time. Where differences arise, officers of the agencies concerned will liaise and consult to ensure that the information released to the public by all agencies is consistent. Agencies must exchange public releases.

Harmonised public communications messages will be released from the following agencies:

- **Bureau of Meteorology** - concentrating on Flood Warnings which are widely disseminated to the BoM website, agencies and the media. BoM also participates in media (radio, television, newspaper) interviews to provide factual information regarding observed and forecast weather conditions, rainfalls and water levels;

- **SEQ Water Grid Manager** - concentrating on the technical aspects of release timings and duration of effects as lead technical agency on floodwater release. Seqwater operational staff are to ensure that technical information is communicated to the SEQ Water Grid Emergency Response Team (if activated) and the SEQ Water Grid Communications Unit;

- **Local Governments /Local Disaster Management Groups** - concentrating on the effects of release and safety for their local communities and residents.

If necessary these will be augmented by:

- **Queensland Police Service** - concentrating on specific community safety messaging during operations;

- **Department of Community Safety** - concentrating on general safety matters regarding flooding;

- **Department of Premier and Cabinet (extreme events only)** - concentrating on consistent messages to all to media and agencies concerned.

Event-specific information will be released to the public as frequently as required by the severity and scope of the event. Timings of media releases will be dependent on the event and may range from once a day to once an hour.

Questions from the Public

All questions from the public should be directed to the relevant local government in the first instance. Any questions relating to the release of water should be directed to the SEQ Water Grid Manager Communications Unit. Any queries about disaster management should be addressed by the relevant local and district disaster management groups.

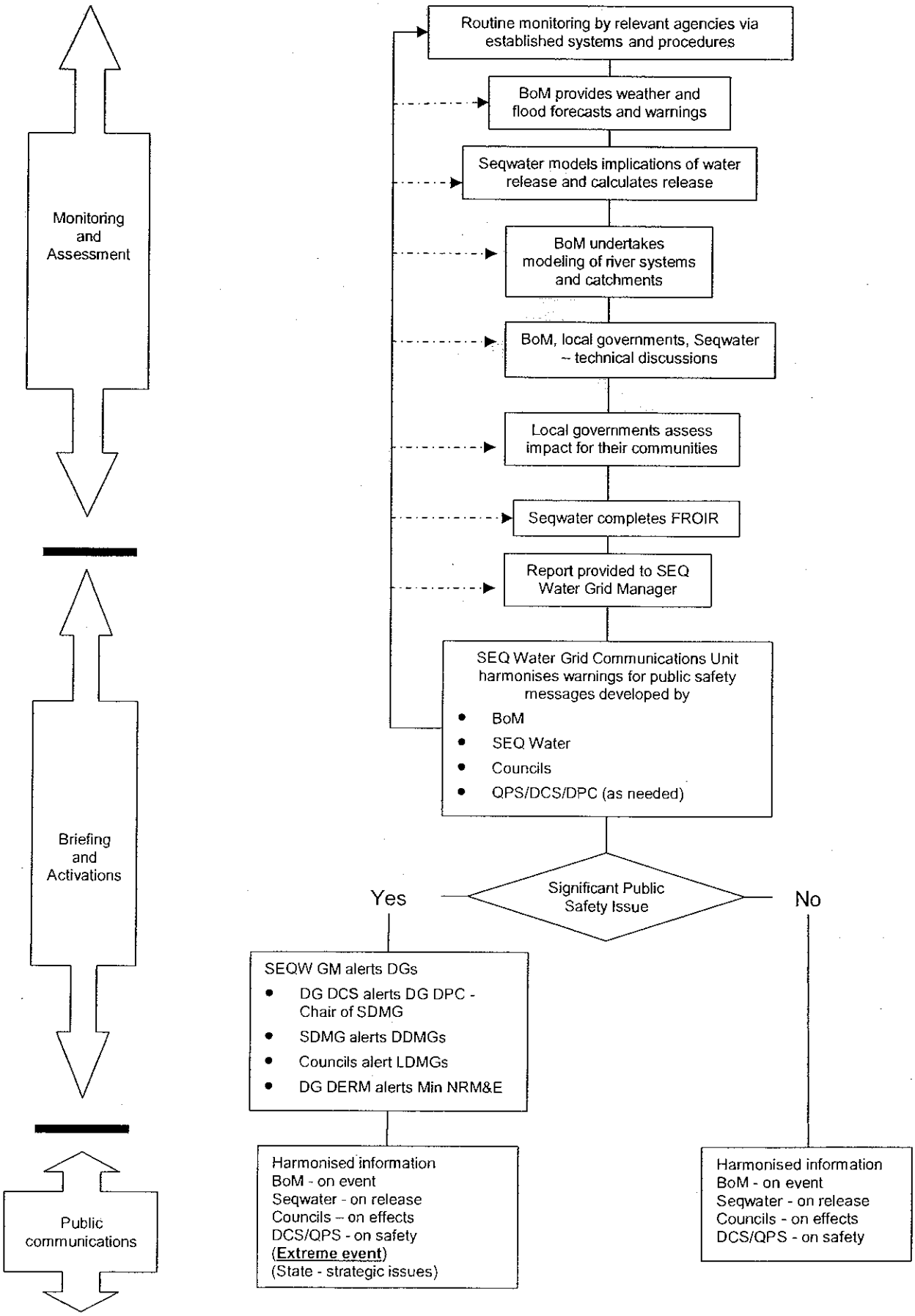
Protocol Maintenance

This protocol will be reviewed annually by agencies involved and exercised, during the years when operational floodwater release does not occur, under DDMG arrangements.

The protocol should provide for a review after each event of what worked and could be improved for management of future events, to be led by DCS.

Appendix A

Release of water from Wivenhoe and Somerset Dams



Appendix B

ROLES AND RESPONSIBILITIES

- The Bureau of Meteorology (BoM) is the agency responsible for issuing flood warnings for the Brisbane River and its major tributaries. These, when required, include rainfall forecasts for the Brisbane catchment and predicted river heights for Brisbane City, Ipswich, Jindalee and Moggill according to established procedures.

  River height predictions are agreed in consultation with South East Queensland Water (Seqwater), Brisbane City Council (BCC), Ipswich City Council (ICC) and Somerset Regional Council (SRC), as required.

- Queensland Bulk Water Supply Authority (Seqwater) operates Wivenhoe and Somerset Dams in accordance with the Flood Mitigation Manual. It provides dam outflow information to BoM, to allow the development of Flood Warnings and to local authorities, to assist them in quantifying likely impacts within their areas.

  It informs BoM and other agencies on the status of dams, and actual and projected releases from Wivenhoe Dam.

  It consults BoM regarding inflows to Wivenhoe Dam and expected flood heights along the Brisbane River downstream of Wivenhoe Dam.

  Seqwater initiates proposed changes to the Flood Mitigation Manual, undertaking consultation with Councils and other stakeholders.

  Seqwater coordinates the production of the FROIRs.

- Brisbane City Council (BCC), Ipswich City Council (ICC) and Somerset Regional Council (SRC) distribute consistent, detailed local flood level information, both to their respective operational units, their senior management and their broader communities. This should include the interpretation of BoM flood warnings and river height forecasts into expected areas and depths of inundation. Councils are responsible for activating their respective Local Disaster Management Groups (LDMGs), which then undertake the disaster management responsibility for response in the community.

- DERM consults with the stakeholders prior to the approval of any updates to the Flood Mitigation Manual. DERM also approves any necessary variations to the strategies in the manual if required during the course of a flood event.

- Queensland Police Service (QPS) assumes a legislative role, as per the Disaster Management system, to provide disaster management at a district level during an event, including provision of necessary community advice for public safety.

- Emergency Management Queensland (EMQ) provides support and general community safety advice on flooding issues, during non-operational times.

- SEQ Water Grid Communications Unit coordinates the general harmonisation, but not specific detail of public messaging with BoM, SEQ Water Grid, BCC and DCS, as required. It does this by ensuring that each agency understands the extent of the release and that there is a general consensus as to the level of potential impacts.

Appendix C

FLOOD RELEASE OPERATIONS AND IMPACT REPORT

OPREP Number		Date of OPREP release		Time of OPREP release	

Next OPREP due	Date		Time		or Event	

This report is at the time of assessment and may be out of date quickly depending on current events. It relies on the timely information provided by Seqwater, BoM and Councils. If any information is not provided by BoM or a Council, the section will remain blank. There will be no follow up requests. Each Authority will provide an email and telephone contact for all communications. If an event escalates, there may be less time to respond or it may not be possible to respond to requests.

The initial step in the process is for Seqwater to email advices on releases to the organisations email address provided. Once a flood event is initiated, at any time a Council or agency can contact Seqwater to discuss if they a serious concern regarding the information on releases provided, this would normally be by phone and followed by email. However the ability to respond to any queries depends on the event. The frequency of advices will depend on the severity of the event and the needs of each agency.

Seqwater will also request at that time, a situation Assessment from each agency as per details outlined in this document. Each agency will then email in return the requested information if possible or advice that it has not changed. If it is not received in the time specified, it is assumed it is not being provided.

Seqwater status of inflows and dam operations

(to include information on the current and/or predicted levels of Somerset and Wivenhoe Dams and the probable or planned release strategy with assessment as governed under the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam)

This is Seqwaters status report on the dam levels, probable inflows and planned releases.

.....

This has been supplied to
BCC on .....
ICC on .....
SRC on .....

Issues raised by Councils were .....

Actions taken were .....

Seqwater Technical Officer name	
Seqwater Technical Officer position title	
Seqwater Technical Officer contact details	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (eg weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM is to provide either a copy of their current information as above by email. This will be their current set of warnings and may be updated or changed at any time.

BoM Technical Officer name	
BoM Technical Officer position title	
BoM Technical Officer contact details	

BCC assessment

(to include predicted local inundation areas and depths of inundation based on the information)

This is an assessment as above provided by BCC. A request for this information will be sent to the email address provided by BCC.
A reply will be required by a specified time and if not received by that time no information will be included.

BCC was contacted to request this information on ... by ...
The following information was received...

BCC Technical Officer name	
BCC Technical Officer position title	
BCC Technical Officer contact details	

Ipswich City Council assessment (if required)

Somerset Regional Council assessment (if required)

(both ICC and SRC requirements are the same as for BCC)

Collated and distributed by Seqwater

Seqwater Contact Officer signature	
Seqwater Contact Officer name	
Seqwater Contact Officer position title	
Seqwater contact details	

[redacted]

From: Barry Dennien
Sent: Thursday, 21 October 2010 11:05 AM
To: [redacted]
Cc: [redacted] Dan Spiller
Subject: FW: Thanks for the work of your staff on the Protocol

fyi

From: Reilly Bob [redacted]
Sent: Thursday, 21 October 2010 11:03 AM
To: Barry Dennien; Peter Borrows
Cc: [redacted]
Subject: Thanks for the work of your staff on the Protocol

Hi Barry, Peter

I would like thank your staff for the work they have done on the draft protocol to date, in the midst of everything else that is going on. Ken Smith has also asked me to pass on his thanks.

Regards

Bob

Bob Reilly

General Manager, Office of the Water Supply Regulator

[redacted]

www.derm.qld.gov.au

Department of Environment and Resource Management

Lvl 3 41 George Street, Brisbane Q 4000

GPO Box 2454, Brisbane Q 4001

+--+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+--+

Dan Spiller

From: [redacted]
Sent: Saturday, 11 December 2010 7:10 AM
To: Dan Spiller
Subject: Fwd: Flood operations at Wivenhoe & North Pine dams

Dan - in Barry's absence. Noting Bobs line re the DG. Mike

Sent from my iPhone

Begin forwarded message:

From: Reilly Bob [redacted]
Date: 10 December 2010 6:53:43 PM AEDT
To: Allen Peter [redacted] Barry Dennien [redacted] Best Debbie [redacted]
Cc: [redacted]
Subject: Re: Flood operations at Wivenhoe & North Pine dams

Hi peter

Thanks for the email.

Brisbane city council has committed to the draft protocol, and the other 2 councils are ok with the approach but have some concerns about the wording.

Therefore it is essential that seqwater follows the draft communication protocol--if any issues arise, then please ask them to contact me.

Debbie

I suggest you let the dg know of this possible release.

Thanks

Bob

----- Original Message -----
From: Allen Peter
To: Reilly Bob
Cc: 'Rob Drury' [redacted]
Sent: Fri Dec 10 17:08:02 2010
Subject: Flood operations at Wivenhoe & North Pine dams

Bob,

Rob Drury has rung me to indicate that there is a significant probability that Wivenhoe will have to operate this weekend. The level is Wivenhoe is EL 67.22 which is already near the first gate opening trigger point of EL 67.25 and there is 50mm of rain forecast for Saturday night/Sunday morning. They have ceased releasing from Somerset to Wivenhoe at the moment to hold the level for the moment. The precise timing of any release will depend on

the speed of a front coming across from the west.

Rob has indicated that he will follow the draft communications protocol as closely as possible when operations are needed. He has already spoken to the Councils and is looking to advise the Grid Manager.

North Pine is also probability going to operate if the rain occurs.

Peter Allen
Director Dam Safety (Water Supply)
Office of the Water Supply Regulator
[redacted]
Email [redacted]
www.derm.qld.gov.au <http://www.nrw.qld.gov.au/>
Department of Environment and Resource Management
3rd Floor 41 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

The information in this email together with any attachments is intended only for the person or entity to which it is addressed and may contain confidential and/or privileged material. Any form of review, disclosure, modification, distribution and/or publication of this email message is prohibited, unless as a necessary part of Departmental business. If you have received this message in error, you are asked to inform the sender as quickly as possible and delete this message and any copies of this message from your computer and/or your computer system network.

+----------+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+----------+

Dan Spiller

From: [redacted]
Sent: Monday, 13 December 2010 8:28 AM
To: Dan Spiller
Subject: FW: Draft Protocol for the Communication of Flooding Information
Attachments: Protocol_Communication of Flooding Information 23 Nov.doc

[redacted]
Director Risk and Technology
SEQ Water Grid Manager
[redacted]
Post: PO Box 16205, BRISBANE CITY EAST, QLD 4002
Visit: Level 15, 53 Albert St, BRISBANE
ABN: 14783 317 630

From: Michael Shapland [redacted]
Sent: Tuesday, 23 November 2010 6:10 PM
To: [redacted] Tony Jacobs; [redacted]
Cc: bob.reilly [redacted]; peter.allen [redacted] Scott Denner [redacted] chris.lavin [redacted] Brad Smith; Bruce Grady; [redacted]
Subject: Draft Protocol for the Communication of Flooding Information

Following councils feedback on the draft protocol, I attach a revised version for your final approval.

The revisions, shown as tracked changes - try to reflect the various views received. The additional comments below give some of the reasons.

- The protocol does not attempt to repeat existing arrangements or responsibilities; just those that require clarification under these circumstances.
- The flow chart has been amended to reflect the stages set out in the main document. It is intended that the paragraphs in that document remain the authoritative version of the two.
- The technical situation report has been amended to remove any trigger information – reflecting the views that judgement of individuals concerned play a more significant role in triggering the protocol.
- Similarly no definition of a public safety issue is attempted; the judgement of those involved in the protocol is again relied on to define this.
- Finally, the protocol reflects DERM's view that the TSR will be initiated at every release of flood water from dams, on the basis that this will be an occasional event.

I'd be grateful for any final changes to Irina Stankovska by COB Friday 26 November.

Regards

Mike

Mike Shapland MBE | Director, Disaster Management
Emergency Management Queensland | Department of Community Safety
Level 2, Block E, Emergency Services Complex, Kedron, Queensland
[redacted]

This correspondence is for the named persons only. It may contain confidential or privileged information or both. No confidentiality or privilege is waived or lost by any mis transmission. If you receive this correspondence in error please delete it from your system immediately and notify the sender. You must not disclose, copy or relay on any part of this correspondence, if you are not the intended recipient. Any opinions expressed in this message are those of the individual sender except where the sender expressly, and with the authority, states them to be the opinions of the Department of Community Safety, Queensland.

All reasonable precautions will be taken to respect the privacy of individuals in accordance with the Information Privacy Act 2009 (Qld). Details on how personal information may be used or disclosed by the Department of Community Safety, Queensland are available from www.communitysafety.qld.gov.au/info/privacy.htm

Protocol for the Communication of Flooding Information for the Brisbane River Catchment - including Floodwater Releases from Wivenhoe and Somerset Dams

OBJECTIVE

The purpose of this protocol is to outline the arrangements for the Brisbane, Ipswich and Somerset Councils, relevant Queensland Government agencies and the Bureau of Meteorology, which will ensure the provision of consistent and robust information to the community, concerning potential flooding impacts for the Brisbane River catchment, including release of floodwater from Wivenhoe and Somerset Dams.

Deleted: to be followed by

The intent is to ensure that consistent, harmonised information, based on an agreed single technical report, is communicated to the public in a way that contributes to resilient communities.

Deleted: point of truth

Formatted: Highlight

BACKGROUND

Queensland's disaster management arrangements, based on disaster management groups at local, district and state level, ensure the collaborative and effective coordination of information for all hazards.

Existing local, district and state disaster management and hazard-specific plans outline arrangements and structures for disaster management, or the hazard, and amongst other things, identify the need for coordination of public communications.

This protocol adds to such plans by outlining specific arrangements necessary when advice to the community needs to be based on technical assessments from hazard-specific primary agencies and other complementary stakeholders across federal, state and local governments.

Factors such as storm surges, tides, creek flooding, flooding from the lower Brisbane River, including Lockyer Creek and the Bremer River, will influence inundation levels in Brisbane.

Wivenhoe Dam controls approximately half of the Brisbane River catchment above Brisbane City. The operational strategy for water release from Wivenhoe and Somerset Dams is governed by the *Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam*, henceforth referred to as the Flood Mitigation Manual.

This protocol also covers the possibility that, during an above-average wet season, the water supply level of the dams may be marginally reduced, on a temporary basis, by small water releases. The water supply level would be returned to normal prior to the conclusion of the wet season, to avoid affecting water supply security. These changes, if they proceed, will ultimately be incorporated into the Flood Mitigation Manual.

GENERAL DECISION MAKING - GUIDING PRINCIPLES

Deleted: ¶

- Protection of public safety is paramount throughout both this Protocol and the Flood Mitigation Manual;

DRAFT

- Impact on the community upstream or downstream is a legitimate consideration of any risk assessment;
- Regular and consistent communications within government and to the public, in relation to flooding impacts, are essential;
- Decision-making chains regarding the communications strategy and disaster management should remain flexible and highly responsive;
- The Flood Mitigation Manual is used to determine how Wivenhoe and Somerset Dams will be operated during flood events.
- This Protocol does not infringe the right of any party to issue information in line with their responsibilities.

PROCESS OF COMMUNICATION

There are three stages in the process of communication:

- Monitoring and Assessment
- Briefing and Activation
- Public Communications

Monitoring and Assessment

Communications with the public on flooding information, including floodwater releases, are based on a continuous process of monitoring and technical assessment. The process is dynamic and evolves according to the event, but will normally contain the following steps:

- Routine monitoring of weather events and dam levels by relevant agencies via established systems and procedures;
- The Bureau of Meteorology (BoM) provides weather forecasts and warnings (e.g. Tropical Cyclone, Severe Weather, Severe Thunderstorm, Flood). In the event of heavy rain and runoff in the Wivenhoe and/or Somerset Dam catchments, BoM and the Queensland Bulk Water Supply Authority (Seqwater) discuss modelled inflows to Wivenhoe and/or Somerset Dam, and downstream flood levels.
- Councils monitor, to the extent that they are able, creek levels, local runoff and flash flooding, consult with BoM and Seqwater on other potential events upstream that may contribute to and aggravate the situation.
- Seqwater discusses and models implications of the inflows on the necessary floodwater release from Wivenhoe Dam and/or Somerset Dam. The floodwater release strategy is a balance between releasing the water quickly enough so that the flood storage capacity is available if another major rain event occurs, versus minimising downstream flooding impacts (human safety and property damage) from the releases.
- Seqwater calculates the floodwater releases according to dam levels and predicted weather events in accordance with the Flood Mitigation Manual. A fundamental principle is that all floodwater should be released from the dams within seven days of the flood event peaking in Wivenhoe or Somerset Dam. This ensures the dams can cope with closely spaced major rain events.
- Seqwater shares predicted floodwater releases with BoM and with the Councils.
- Councils with the ability to monitor flooding share information on the status of

Formatted: Indent: Left: 0 cm, Bulleted + Level: 1 + Aligned at: 0.63 cm + Tab after: 1.27 cm + Indent at: 1.27 cm, Tab stops: 0.63 cm, List tab + Not at 1.27 cm

Formatted: Indent: Left: 0 cm, Bulleted + Level: 1 + Aligned at: 0.63 cm + Tab after: 1.27 cm + Indent at: 1.27 cm, Tab stops: 0.63 cm, List tab + Not at 1.27 cm

Formatted: Indent: Left: 0 cm, Bulleted + Level: 1 + Aligned at: 0.63 cm + Tab after: 1.27 cm + Indent at: 1.27 cm, Tab stops: 0.63 cm, List tab + Not at 1.27 cm

Formatted: Indent: Left: 0 cm, Bulleted + Level: 1 + Aligned at: 0.63 cm + Tab after: 1.27 cm + Indent at: 1.27 cm, Tab stops: 0.63 cm, List tab + Not at 1.27 cm

Formatted: Indent: Left: 0 cm, Bulleted + Level: 1 + Aligned at: 0.63 cm + Tab after: 1.27 cm + Indent at: 1.27 cm, Tab stops: 0.63 cm, List tab + Not at 1.27 cm

Formatted: Indent: Left: 0 cm, Bulleted + Level: 1 + Aligned at: 0.63 cm + Tab after: 1.27 cm + Indent at: 1.27 cm, Tab stops: 0.63 cm, List tab + Not at 1.27 cm

Formatted: Indent: Left: 0 cm, Bulleted + Level: 1 + Aligned at: 0.63 cm + Tab after: 1.27 cm + Indent at: 1.27 cm, Tab stops: 0.63 cm, List tab + Not at 1.27 cm

DRAFT

the Brisbane River catchment and its river systems with each other, BoM, Seqwater,

- BoM undertakes modelling of the Brisbane River catchment and its river systems using Seqwater advice of actual and projected Wivenhoe Dam and/or Somerset Dam releases when these are occurring, or are expected to occur.

- BoM participates in technical discussions with Seqwater, Brisbane City Council, Ipswich City Council and Somerset Regional Council as necessary, to share modelling results. The discussions aim to establish a technical agreement on the flood situation, on which public communications should be based.

- Councils with the necessary resources and expertise undertake modelling, form predictions, identify flood inundation areas and assess impacts for their communities, and regularly share this information with all relevant parties. Councils without the necessary resources and expertise will rely on information from other agencies to complete the impact assessment for their communities.

During this continuous process, it may become apparent to either BoM, local governments or Seqwater that the situation is likely to result in public safety issues.

These public safety issues may arise from a decision to release floodwater, a significant change in the severity and scope of the event, or a pre-agreed trigger-point being reached.

Any of the agencies may initiate the public communications process and engage with the disaster management arrangements as appropriate.

The trigger points for commencing public communication of flooding information are defined according to an agency's responsibilities.

The initiating agency will instigate a technical staff teleconference. Decisions from the teleconference will be distributed to senior management and media representatives of each agency.

In these circumstances all agencies agree that technical advice will form the basis of public communications messages.

- In every case of floodwater release from Wivenhoe or Somerset Dam, Seqwater coordinates the completion of the Technical Situation Report - TSR (Appendix C) and provides the Report to the SEQ Water Grid Manager (according to their Emergency Response Plan), and to relevant local governments.

- In other circumstances where a formal technical statement would enhance clarity, the local or state agency initiating the public communication of flooding information will pull together relevant information from other agencies in the form of a TSR. If initiated, the TSR should be circulated to all parties.

Briefing and Activation

If public safety is considered to be at risk, consideration will be given to the activation of the disaster management arrangements, if not already activated.

1. Councils will consider activating their Local Disaster Management Groups (LDMGs);

2. LDMGs will inform the relevant District Disaster Coordinators (DDCs);

Deleted: and

Deleted: and other councils

Formatted: Indent: Left: 0 cm, Bulleted + Level: 1 + Aligned at: 0.63 cm + Tab after: 1.27 cm + Indent at: 1.27 cm, Tab stops: 0.63 cm, List tab + Not at 1.27 cm

Deleted: ,

Formatted: Indent: Left: 0 cm, Bulleted + Level: 1 + Aligned at: 0.63 cm + Tab after: 1.27 cm + Indent at: 1.27 cm, Tab stops: 0.63 cm, List tab + Not at 1.27 cm

Formatted: Indent: Left: 0 cm, Bulleted + Level: 1 + Aligned at: 0.63 cm + Tab after: 1.27 cm + Indent at: 1.27 cm, Tab stops: 0.63 cm, List tab + Not at 1.27 cm

Deleted: ¶
¶

Deleted: the

Deleted: it considers significant

Deleted: initiating

Deleted: may

Deleted: coordinate the completion

Deleted: C

Deleted:

3. The Queensland Police Service (QPS) will consider initiating disaster management actions as provided for under the *Disaster Management Act 2003*;

4. In the case of floodwater release;

(a) the SEQ Water Grid Manager will alert the Director-General (DG) of the Department of Community Safety (DCS), DG Department of Environment and Resource Management (DERM), and the local governments;

(b) DG DCS will inform the DG of the Department of Premier and Cabinet (DPC) - the Chair of the State Disaster Management Group (SDMG) and will activate the State Disaster Coordination Centre (SDCC). DG DCS will also inform the Minister for Police, Corrective Services and Emergency Services;

(c) DG DERM will inform the Minister for Natural Resources, Mines and Energy;

(d) DG DPC will inform the Premier;

5. In the case of an extreme event, the Crisis Communications Network, chaired by DPC, may be activated at the direction of the SDMG Chair to coordinate public messaging from BoM, Seqwater, SEQ Water Grid Manager, QPS, relevant Councils and DCS as per this protocol;

6. In the case of a non-disaster, public communications will be in accordance with existing arrangements, supported, where appropriate, by this protocol.

Public Communications Issues

Each agency has its own responsibilities to issue information commensurate with their role without prior approvals. The obligation under this protocol is to share that information with other agencies and operate in a fully consultative process to ensure consistent public information.

The BoM, Local Governments and relevant State Government agencies agree to maintain continual discussions, to ensure that conflicting information is not released to the public at any time. Genuine efforts should be made to ensure consistency by basing public communications on technical reports. Inter-agency consultation should not cause delays in the issuance of public warnings. All agencies agree to exchange public communications at time of release. No power of veto to any organisation is implied under this protocol.

Harmonised public communications messages will be released from the following agencies:

- **Bureau of Meteorology** - concentrating on Flood Warnings which are widely disseminated to the BoM website, agencies and the media. BoM also participates in media (radio, television, newspaper) interviews to provide factual information regarding observed and forecast weather conditions, rainfalls and water levels;
- **Local Governments / Local Disaster Management Groups** - concentrating on the effects of weather related events and safety for their local communities and residents, and the impacts on councils' assets. Local governments have primacy of public communications within their community. Community service

Deleted: ,

Formatted: Indent: Left: 1.27 cm, Numbered + Level: 2 + Numbering Style: a, b, c, ... + Start at: 1 + Alignment: Left + Aligned at: 1.9 cm + Tab after: 2.54 cm + Indent at: 2.54 cm, Tab stops: 1.9 cm, List tab + Not at 2.54 cm

Formatted: Bullets and Numbering

Deleted: ;

Formatted: Indent: Left: 1.27 cm, Numbered + Level: 2 + Numbering Style: a, b, c, ... + Start at: 1 + Alignment: Left + Aligned at: 1.9 cm + Tab after: 2.54 cm + Indent at: 2.54 cm, Tab stops: 1.9 cm, List tab + Not at 2.

Formatted: Bullets and Numbering

Deleted: ;

Formatted: Indent: Left: 1.27 cm, Numbered + Level: 2 + Numbering Style: a, b, c, ... + Start at: 1 + Alignment: Left + Aligned at: 1.9 cm + Tab after: 2.54 cm + Indent at: 2.54 cm, Tab stops: 1.9 cm, List tab + Not at 2.54 cm

Formatted: Bullets and Numbering

Deleted: ;

Formatted: Indent: Left: 1.27 cm, Numbered + Level: 2 + Numbering Style: a, b, c, ... + Start at: 1 + Alignment: Left + Aligned at: 1.9 cm + Tab after: 2.54 cm + Indent at: 2.54 cm, Tab stops: 1.9 cm, List tab + Not at 2.54 cm

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Deleted: are

Deleted: must

Deleted: Local governments that have

Deleted: P

Deleted: pre-

Deleted: agreed

Deleted: scripted c

Formatted: Not Highlight

DRAFT

announcements from local governments will be shared with the relevant agencies, prior to public release if time allows;

- **SEQ Water Grid Manager** - if floodwater releases from Wivenhoe and Somerset dams are involved, the SEQ Water Grid Manager concentrates on the communication aspects of release timings and duration of effects as the State's lead communication agency on floodwater release. Seqwater operational staff are to ensure that technical information is communicated to the SEQ Water Grid Emergency Response Team (if activated), the SEQ Water Grid Communications Unit and relevant local governments.

If necessary these will be augmented by:

- **Queensland Police Service** - concentrating on specific community safety messaging during operations;
- **Department of Community Safety** - concentrating on general safety matters regarding flooding;
- **Department of Premier and Cabinet (extreme events only)** - concentrating on consistent messages to media and agencies concerned.

Event-specific information will be released to the public as frequently as required by the severity and scope of the event. Timings of media releases will be dependent on the event, guided by the frequency of technical reports and may range from once a day to once an hour.

In the case of floodwater release from Wivenhoe and/or Somerset Dam, SEQ Water Grid Communications Unit will centrally track all communications and ensure they are shared. The unit will liaise with the following or their representatives over pubic safety messages:

- BoM;
- Seqwater;
- Councils' Media Directors;
- QPS Media Director; and
- DCS Media Director.

Questions from the Public

All questions from the public should be directed to the relevant local government in the first instance. Questions expressly relating to the event should be directed to the hazard-specific primary agency. Any questions relating to the release of floodwater should be directed to the SEQ Water Grid Communications Unit. Any queries about disaster management should be addressed by the relevant local and district disaster management groups.

Protocol Maintenance

This protocol will be reviewed annually by agencies involved and exercised, during non-operational season, under DDMG arrangements.

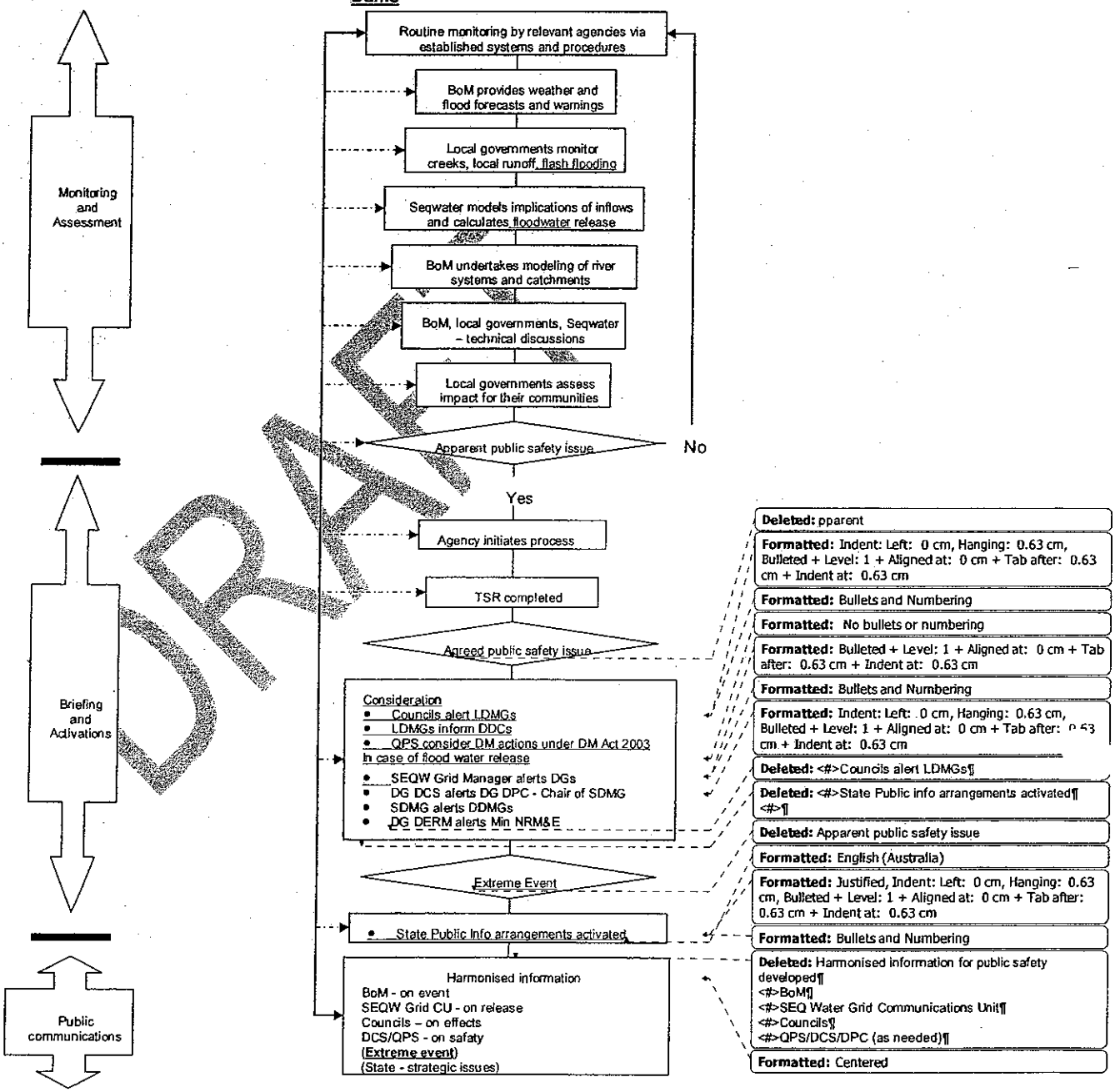
The protocol should provide for a review after each event of what worked and could be improved for management of future events, to be led by DCS.

Deleted: from local governments
Deleted: be shared
Deleted: share these announcements w
Formatted: Not Highlight
Formatted: Not Highlight
Formatted: Not Highlight
Formatted: Not Highlight
Formatted: Not Highlight
Deleted: significant
Deleted: considered significant

DRAFT

Appendix A

Communications process for the release of floodwater from Wivenhoe and Somerset Dams



Appendix B

ROLES AND RESPONSIBILITIES

- The Bureau of Meteorology (BoM) is the agency responsible for issuing flood warnings for the Brisbane River and its major tributaries. These, when required, include rainfall forecasts for the Brisbane catchment and predicted river heights for Brisbane City, Ipswich, Jindalee and Moggill according to established procedures.

  River height predictions are agreed in consultation with Seqwater, Brisbane City Council (BCC), Ipswich City Council (ICC) and Somerset Regional Council (SRC), as required.

- Queensland Bulk Water Supply Authority (Seqwater) operates Wivenhoe and Somerset Dams in accordance with the Flood Mitigation Manual. It provides dam outflow information to BoM, to allow the development of Flood Warnings and to local authorities, to assist them in quantifying likely impacts within their areas.

  It informs BoM and other agencies on the status of dams, and actual and projected releases from Wivenhoe and Somerset dams. It consults BoM regarding inflows to Wivenhoe and Somerset dams and expected flood heights along the Brisbane River downstream of Wivenhoe Dam.

  Seqwater initiates proposed reviews or updates to the Flood Mitigation Manual, undertaking consultation with Councils and other stakeholders. Seqwater coordinates the production of the TSRs relating to floodwater releases from the Wivenhoe and Somerset dams.

- Brisbane City Council (BCC), Ipswich City Council (ICC) and Somerset Regional Council (SRC) distribute consistent, detailed local flood level information, both to their respective operational units, their senior management and their broader communities. This should include the interpretation of BoM flood warnings and river height forecasts into expected areas and depths of inundation. Councils are responsible for activating their respective Local Disaster Management Groups (LDMGs), which then undertake the disaster management responsibility for response in the community.

- Department of Environment and Resource Management (DERM) consults with the stakeholders prior to the approval of any updates to the Flood Mitigation Manual. DERM also approves any necessary variations to the strategies in the manual if required during the course of a flood event.

- Queensland Police Service (QPS) assumes a legislative role, as per the disaster management system, to provide disaster management at a district level during an event, including provision of necessary community advice for public safety.

- Emergency Management Queensland (EMQ) provides support and general community safety advice on flooding issues, during non-operational times.

- SEQ Water Grid Manager in the case of floodwater release alerts the Director-General (DG) of the Department of Community Safety (DCS), DG Department of Environment and Resource Management (DERM), and the local governments.

- SEQ Water Grid Communications Unit tracks the general harmonisation, but not specific detail of public messaging relating to floodwater releases, with BoM, SEQ Water Grid, Councils and DCS, as required. It does this by ensuring that each agency understands the extent of the release and that there is a general consensus as to the level of potential impacts.

Formatted: Underline

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Appendix C

TECHNICAL SITUATION REPORT

TSR Number		Date of TSR release		Time of TSR release	

This report is as at the time of assessment, and may quickly become out of date, depending on the current events. It relies on timely information provided by Seqwater, BoM and Councils. A reply will be required by a specified time and if not received by that time no information will be included. If any information is not provided, the section will remain blank. There will be no follow up requests.

Each authority will provide an email and telephone contact for all communications. If an event escalates, there may be less time to respond or it may not be possible to respond to requests.

In floodwater releases Seqwater will email advices on releases to the organisations email address provided. Once a flood event is initiated, at any time a Council or agency can contact Seqwater to discuss if they have a serious concern regarding the information on releases provided. This would normally be by phone and followed by email. However, the ability to respond to any queries depends on the event. The frequency of advices will depend on the severity of the event and the needs of each agency.

Seqwater will also request at that time, a situation assessment from each agency as per details outlined in this document. Each agency will then email in return the requested information if possible or advice that it has not changed. If it is not received within the specified timeframe, it is assumed it is not being provided.

DRAFT

Deleted: ~~TRIGGERS~~ ... [1]
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough

Seqwater status of inflows and dam operations

(to include information on the current and/or predicted levels of Somerset and Wivenhoe Dams and the probable or planned release strategy with assessment as governed under the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam)

This is Seqwater's status report on the dam levels, probable inflows and planned releases.

.....

This has been supplied to
BCC on .....
ICC on .....
SRC on .....

Issues raised by Councils were .....

Actions taken were .....

Seqwater Technical Officer name	
Seqwater Technical Officer position title	
Seqwater Technical Officer contact details	

DRAFT

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM is to provide either a copy of, or links to, their current information and other updates or comments if needed. This will be their current set of warnings and may be updated or changed at any time.

BoM Technical Officer name	
BoM Technical Officer position title	
BoM Technical Officer contact details	

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

This is an assessment as provided by BCC. A request for this information will be sent to the email address provided by BCC.

BCC Technical Officer name	
BCC Technical Officer position title	
BCC Technical Officer contact details	

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

This is an assessment as provided by ICC. A request for this information will be sent to the email address provided by ICC.

ICC Technical Officer name	
ICC Technical Officer position title	
ICC Technical Officer contact details	

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

This is an assessment as provided by SRC. A request for this information will be sent to the email address provided by SRC.

SRC Technical Officer name	
SRC Technical Officer position title	
SRC Technical Officer contact details	

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	
Contact Officer position title	

Next TSR due	Date		Time		or Event

DRAFT

Page 8: [1] Deleted	Shapland	22/11/2010 6:30:00 PM

~~TRIGGERS~~	
~~These illustrative triggers provide guidance to initiation of this report~~	
~~BoM~~	
~~Seqwater~~	
~~Local Government~~	

From: Barry Dennien <[redacted]

Sent: Monday, February 14, 2011 3:18 PM

To: [redacted] Mike Foster

Cc: [redacted] Dan Spiller

Subject: RE: Meeting

[redacted] Mike

We are arranging the meeting, [redacted] knows the folks at EMQ and will be in contact

Regards

Barry

-----Original Message-----
From: [redacted]
Sent: Monday, 14 February 2011 2:33 PM
To: Mike Foster
Cc: Barry Dennien
Subject: FW: Meeting
Importance: High

Mike

Following our discussions regarding using the emergency services sms alert system for residents downstream of Wivenhoe - can Barry and/or Peter B meeting with Emergency Services DG this week to progress.

Advice back would be appreciated.

Thanks

[redacted]

From: [redacted]
Sent: Monday, 14 February 2011 2:22 PM
To: [redacted]
Subject: Meeting

The DG of Community Safety, [redacted] said he will meet with the reps from SEQ water.

Contact is [redacted] to speak to Executive Assistant [redacted] to set up a meeting time.

[redacted]

[redacted]

Senior Policy Advisor

Office of the Minister for Police
Corrective Services and Emergency Services

Mobile:
Phone:
Fax:
Email:

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and /or publication of this email is also prohibited.

Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.

Please consider the environment before printing this email.

Litsupport Brisbane

From: Martin.Peter[redacted]
Sent: Monday, 27 December 2010 2:35 PM
To: Dan Spiller
Cc: [redacted]
Subject: RE: Preparation and distribution of Technical Situation Report

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Dan,

Appreciate the contact and thank you for including me on future technical situation reports. That will be most helpful. Also don't hesitate to contact me should I be of assistance.

Other potential recipients are listed above. They include:

[redacted] Deputy DDC, Brisbane) o[redacted]
to the DDC, Brisbane) or[redacted]

I would recommend that you contact[redacted]n the first instance with respect to our input into future reports. He can be contacted on[redacted] or don't hesitate to ring me on[redacted]

Kind regards. Peter

Peter Martin
Assistant Commissioner
METROPOLITAN NORTH REGION
[redacted]

From: Dan Spiller [mailto[redacted]
Sent: Monday, 27 December 2010 1:43 PM
To: Martin.PeterJ[MNR]
Cc: Debbie Best[redacted] Peter Borrows[redacted]
Subject: Preparation and distribution of Technical Situation Report

Peter,

As agreed, I will include you and any other officers you nominate on the distribution list for the daily Technical Situation Reports.

We will also ensure that an appropriate contact is consulted as part of the preparation of the Technical Situation Report, and the results of that consultation noted in the report.

When you have an opportunity, can you please advise me of:

- any other officers we should include in the distribution list, besides yourself
- the officer that Seqwater should consult when preparing the report.

As background, the purpose of the protocol and technical report is to ensure that there is appropriate coordination and consultation about dam operate. It ensures that BoM and Councils:

- are advised of proposed operations and can request refinements to them
- provide feedback to us on likely impacts
- can formally raise concerns about proposed actions.

Our part of the protocol relates to dam operations. However, the local impacts of those releases, including local flooding and road closures, are the responsibility of the Councils. As you appreciate, Council roads may be closed for a range of reasons aside from our dam operations - and may not be trafficably immediately after river levels fall (as Kholo Bridge has demonstrated).

We will expand the protocol to ensure that you are consulted at appropriate times. We are happy to distribute it to any other organisations you consider appropriate.

The 1800 number may also be of assistance - it was established by Seqwater in the last couple of weeks and provides details about dam releases. It is updated twice daily. The number is 1800 613 122.

My details are below. Please contact me at any time if you require any further information.

Regards,

Dan

Daniel Spiller

Director, Operations

SEQ Water Grid Manager

[redacted]

Visit: Level 15, 53 Albert Street Brisbane

Post: PO Box 16205, City East QLD 4002

ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
****

CONFIDENTIALITY: The information contained in this electronic mail message and any electronic files attached to it may be confidential information, and may also be the subject of legal professional privilege and/or public interest immunity. If you are not the intended recipient you are required to delete it. Any use, disclosure or copying of this message and any attachments is unauthorised. If you have received this electronic message in error, please inform the sender or contact securityscanner@police.qld.gov.au. This footnote also confirms that this email message has been checked for the presence of computer viruses.
****

Litsupport Brisbane

From: Dan Spiller
Sent: Monday, 27 December 2010 1:43 PM
To: Martin.Peter[redacted]
Cc: Debbie Best[redacted] Peter Borrows[redacted]
Subject: Preparation and distribution of Technical Situation Report

Follow Up Flag: Follow up
Flag Status: Flagged

Peter,

As agreed, I will include you and any other officers you nominate on the distribution list for the daily Technical Situation Reports.

We will also ensure that an appropriate contact is consulted as part of the preparation of the Technical Situation Report, and the results of that consultation noted in the report.

When you have an opportunity, can you please advise me of:

- any other officers we should include in the distribution list, besides yourself
- the officer that Seqwater should consult when preparing the report.

As background, the purpose of the protocol and technical report is to ensure that there is appropriate coordination and consultation about dam operate. It ensures that BoM and Councils:

- are advised of proposed operations and can request refinements to them
- provide feedback to us on likely impacts
- can formally raise concerns about proposed actions.

Our part of the protocol relates to dam operations. However, the local impacts of those releases, including local flooding and road closures, are the responsibility of the Councils. As you appreciate, Council roads may be closed for a range of reasons aside from our dam operations - and may not be trafficably immediately after river levels fall (as Kholo Bridge has demonstrated).

We will expand the protocol to ensure that you are consulted at appropriate times. We are happy to distribute it to any other organisations you consider appropriate.

The 1800 number may also be of assistance - it was established by Seqwater in the last couple of weeks and provides details about dam releases. It is updated twice daily. The number is 1800 613 122.

My details are below. Please contact me at any time if you require any further information.

Regards,

Dan

Daniel Spiller

Director, Operations

SEQ Water Grid Manager

[redacted]

Visit: Level 15, 53 Albert Street Brisbane

Post: PO Box 16205, City East QLD 4002

ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

Litsupport Brisbane

From: Best Debbie [redacted]
Sent: Monday, 27 December 2010 1:32 PM
To: Dan Spiller
Subject: Re: Water Grid technical and media update: 27/12

I spoke with Peter. He thought it was a WGM responsibility. I asked him to resolve with yoy. Can you let me know the resolution?
Thanks

----- Original Message -----
From: Dan Spiller [redacted]
To: Best Debbie
Sent: Mon Dec 27 12:07:53 2010
Subject: Re: Water Grid technical and media update: 27/12

WGM does not, aside from occasional requests such as yesterday. Seqwater may. I will check.

Dan

On 27/12/2010, at 12:01 PM, "Best Debbie" [redacted]

> Do you communicate with the Brisbane DDC- disaster co-ordination group?
>
> ----- Original Message -----
> From: Dan Spiller [redacted]
> To: Best Debbie; [redacted]
> Sent: Mon Dec 27 11:00:07 2010
> Subject: FW: Water Grid technical and media update: 27/12
>
> Further to previous:
>
> * Somerset Regional Council is calling people who will be isolated by the increased releases. They have noted that their database of affected residents is incomplete.
> * I have advised CEO BCC of the increased releases
>
> Dan
>
> _____
>
> From: Dan Spiller
> Sent: Monday, 27 December 2010 10:36 AM
> To: stephen.robertson [redacted] Debbie Best [redacted]
> Cc: [redacted] Rob Drury [redacted] Damien Brown [redacted] bob.reilly [redacted]
> Subject: Water Grid technical and media update: 27/12
>
>
> All,

>
> Updated Seqwater technical report attached.
>
> Key points are:
>
> * Above 50mm of rainfall in dam catchments over past 24 hours
> * Wivenhoe and Somerset Dam reached 106% of combined capacity despite a single gate being opened yesterday morning
> * The other four gates will be opened tonight or early tomorrow in order to empty the flood compartment. The release rate will be similar to the peak last week and in October
> * Burtons Bridge will be inundated, initially due to Lockyer Valley flows. We are seeking to ensure that Council notifies residents who will be isolated - as per Councils agreement with us on Friday - and to delay closure until at least mid afternoon

> * The increased releases will not reach Brisbane until Wednesday. By that time, peak tides will be at least 0.5 metres lower than last week. For comparison, dam releases contributed about 0.2 metres to peak river levels last week. Other factors impact on river levels and local flooding, including local rainfall
> * Releases are also being made from North Pine, Hinze and Leslie Harrison dams, with some local impacts
>
Draft Water Grid media update for today is below. This will be issued in the next half hour.
>
>
>
> Regards,
>
> Dan
>
>
>
>
>
>
>
> 27 December 2010
>
>

Flood safety for South East Queensland over holiday season
>
>
>
> Rainfall has resulted in increased releases from Water Grid dams.
>
>
>
> About 50mm of rainfall has been recorded in the dam catchments over the past 24 hours.
>
>
>
> Wivenhoe and Somerset dams have increased to 106% of combined capacity, despite continuing minor releases.
>
>
>

> At Wivenhoe Dam, one of five gates was opened at 9am on Boxing Day. The remaining four gates will be opened late this afternoon or early tomorrow morning.
>
>
>
> The gates are expected to remain open until at least Thursday, depending upon inflows.
>
>
>
> With further rain forecast over coming days, it is important that the flood compartment be emptied.
>
>
>
> Burtons Bridge is expected to be closed, with the status of other local bridges remaining unchanged.
>
>
>
> Somerset Dam is now releasing approximately 12,000 megalitres per day into Wivenhoe Dam, with valves expected remain open until mid-week.
>
>
>
> At North Pine Dam, a release commenced around 8pm last night and is expected to continue until at least early tomorrow morning. Youngs Crossing is inundated.
>
>
>
> Releases from Hinze Dam also commenced last night. Weedons Crossing was inundated prior to the gate release.
>
>
>
> A gate release is also continuing from Leslie Harrison Dam, but is expected to cease later on 27 December.
>
>
>
For recorded information on current dam releases in South East Queensland, members of the public are encouraged to call 1 800 613 122.
>
>
>
> Members of the public seeking information on local flooding impacts, including road closures, should contact the local council.
>
>
>
> Recreation update
>
>
>
> Both Wivenhoe and Somerset Dams are currently open for water-based recreation activities, however this may change at short notice depending on weather.
>
>

>
> Billies Bay and river access at Atkinsons Crossing at Wivenhoe Dam remain closed.
>
>
>
> All other recreational sites have reopened however this status may change at short notice depending on the weather.
>
>
>
> While some low-lying camp grounds at Wivenhoe have been inundated due to rain, most camping facilities are open, though some are fully booked.
>
>
>
> If further heavy rain occurs, it may be necessary for some camping grounds to close.
>
>
>
> Please contact the operators of the various camping grounds for information regarding each site.

>
>
> For further information on the Water Grid: www.watergrid.com.au
<http://www.watergrid.com.au/>
>
>
>
>
>
> ENDS
>
>
>
>
>
>
>

_____
>
> This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
> If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
> While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
>
>

>
> +--+
> Think B4U Print
> 1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
> 3 sheets of A4 paper = 1 litre of water
> +--+
>

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.

While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

Litsupport Brisbane

From: Mike Foste[redacted]
Sent: Monday, 27 December 2010 12:27 PM
To: Dan Spiller; Rob Drury
Subject: Re: Fwd: Water Grid technical and media update: 27/12

Dan ..checking with rob

As I understand we do not communicate directly. Our comms is with bcc operations.

Chrs

Mike

From: Dan Spiller [redacted]
To: Mike Foster
Sent: Mon Dec 27 12:08:58 2010
ıbject: Fwd: Water Grid technical and media update: 27/12

Mike,

Do you guys speak to the DDC directly?

Dan

Begin forwarded message:

> **From:** Best Debbie [redacted]
> **Date:** 27 December 2010 12:00:56 PM GMT+10:00
> **To:** Dan Spiller [redacted]
> **Subject: Re: Water Grid technical and media update: 27/12**
>
> Do you communicate with the Brisbane DDC- disaster co-ordination group?
>
> ----- Original Message -----
> From: Dan Spiller [redacted]
> To: Best Debbie; [redacted]
> Sent: Mon Dec 27 11:00:07 2010
> Subject: FW: Water Grid technical and media update: 27/12
>
> Further to previous:
>
> * Somerset Regional Council is calling people who will be isolated by the increased releases. They have noted that their database of affected residents is incomplete.
> * I have advised CEO BCC of the increased releases
>
> Dan

From: Dan Spiller
Sent: Monday, 27 December 2010 10:36 AM
To: stephen.robertson [redacted] Debbie Best [redacted]
Cc: [redacted] Rob Drury [redacted]
Damien Brown [redacted] bob.reilly [redacted]
Subject: Water Grid technical and media update: 27/12

All,

Updated Seqwater technical report attached.

Key points are:

* Above 50mm of rainfall in dam catchments over past 24 hours
* Wivenhoe and Somerset Dam reached 106% of combined capacity despite a single gate being opened yesterday morning
* The other four gates will be opened tonight or early tomorrow in order to empty the flood compartment. The release rate will be similar to the peak last week and in October
* Burtons Bridge will be inundated, initially due to Lockyer Valley flows. We are seeking to ensure that Council notifies residents who will be isolated - as per Councils agreement with us on Friday - and to delay closure until at least mid afternoon
* The increased releases will not reach Brisbane until Wednesday. By that time, peak tides will be at least 0.5 metres lower than last week. For comparison, dam releases contributed about 0.2 metres to peak river levels last week. Other factors impact on river levels and local flooding, including local rainfall
* Releases are also being made from North Pine, Hinze and Leslie Harrison dams, with some local impacts

Draft Water Grid media update for today is below. This will be issued in the next half hour.

Regards,

Dan

27 December 2010

Flood safety for South East Queensland over holiday season

Rainfall has resulted in increased releases from Water Grid dams.

About 50mm of rainfall has been recorded in the dam catchments over the past 24 hours.

Wivenhoe and Somerset dams have increased to 106% of combined capacity, despite continuing minor releases.

At Wivenhoe Dam, one of five gates was opened at 9am on Boxing Day. The remaining four gates will be opened late this afternoon or early tomorrow morning.

The gates are expected to remain open until at least Thursday, depending upon inflows.

With further rain forecast over coming days, it is important that the flood compartment be emptied.

Burtons Bridge is expected to be closed, with the status of other local bridges remaining unchanged.

Somerset Dam is now releasing approximately 12,000 megalitres per day into Wivenhoe Dam, with valves expected remain open until mid-week.

At North Pine Dam, a release commenced around 8pm last night and is expected to continue until at least early tomorrow morning. Youngs Crossing is inundated.

Releases from Hinze Dam also commenced last night. Weedons Crossing was inundated prior to the gate release.

A gate release is also continuing from Leslie Harrison Dam, but is expected to cease later on 27 December.

For recorded information on current dam releases in South East Queensland, members of the public are encouraged to call 1 800 613 122.

Members of the public seeking information on local flooding impacts, including road closures, should contact the local council.

Recreation update

Both Wivenhoe and Somerset Dams are currently open for water-based recreation activities, however this may change at short notice depending on weather.

Billies Bay and river access at Atkinsons Crossing at Wivenhoe Dam remain closed.

All other recreational sites have reopened however this status may change at short notice depending on the weather.

While some low-lying camp grounds at Wivenhoe have been inundated due to rain, most camping facilities are open, though some are fully booked.

If further heavy rain occurs, it may be necessary for some camping grounds to close.

Please contact the operators of the various camping grounds for information regarding each site.

For further information on the Water Grid: www.watergrid.com.au <http://www.watergrid.com.au/>

ENDS

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

+----------+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+----------+

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any fonn of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this

email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Litsupport Brisbane

From: Dan Spiller
Sent: Monday, 27 December 2010 12:08 PM
To: Best Debbie
Subject: Re: Water Grid technical and media update: 27/12

WGM does not, aside from occasional requests such as yesterday. Seqwater may. I will check.

Dan

On 27/12/2010, at 12:01 PM, "Best Debbie" [redacted] wrote:

> Do you communicate with the Brisbane DDC- disaster co-ordination group?
>
> ----- Original Message -----
> From: Dan Spiller [redacted]
> To: Best Debbie; [redacted]
> Sent: Mon Dec 27 11:00:07 2010
> Subject: FW: Water Grid technical and media update: 27/12
>
> Further to previous:
>
> * Somerset Regional Council is calling people who will be isolated by the increased releases. They have noted that their database of affected residents is incomplete.
> * I have advised CEO BCC of the increased releases
>
> Dan
>
> _____
>
> From: Dan Spiller
> Sent: Monday, 27 December 2010 10:36 AM
> To: stephen.robertson [redacted] Debbie Best [redacted] Rob Drury [redacted] Damien Brown [redacted] bob.reilly [redacted]
> Subject: Water Grid technical and media update: 27/12
>
>
> All,
>
> Updated Seqwater technical report attached.
>
> Key points are:
>
> * Above 50mm of rainfall in dam catchments over past 24 hours
> * Wivenhoe and Somerset Dam reached 106% of combined capacity despite a single gate being opened yesterday morning
> * The other four gates will be opened tonight or early tomorrow in order to empty the flood compartment. The release rate will be similar to the peak last week and in October

> * Burtons Bridge will be inundated, initially due to Lockyer Valley flows. We are seeking to ensure that Council notifies residents who will be isolated - as per Councils agreement with us on Friday - and to delay closure until at least mid afternoon
> * The increased releases will not reach Brisbane until Wednesday. By that time, peak tides will be at least 0.5 metres lower than last week. For comparison, dam releases contributed about 0.2 metres to peak river levels last week. Other factors impact on river levels and local flooding, including local rainfall
> * Releases are also being made from North Pine, Hinze and Leslie Harrison dams, with some local impacts
>
> Draft Water Grid media update for today is below. This will be issued in the next half hour.
>
>
>
> Regards,
>
> Dan
>
>
>
>
>
> 27 December 2010
>
>
>
> Flood safety for South East Queensland over holiday season
>
>
>
> Rainfall has resulted in increased releases from Water Grid dams.
>
>
>
> About 50mm of rainfall has been recorded in the dam catchments over the past 24 hours.
>
>
> Wivenhoe and Somerset dams have increased to 106% of combined capacity, despite continuing minor releases.
>
>
>
> At Wivenhoe Dam, one of five gates was opened at 9am on Boxing Day. The remaining four gates will be opened late this afternoon or early tomorrow morning.
>
>
>
> The gates are expected to remain open until at least Thursday, depending upon inflows.
>
>
>
> With further rain forecast over coming days, it is important that the flood compartment be emptied.

>
>
>
> Burtons Bridge is expected to be closed, with the status of other local bridges remaining unchanged.
>
>
>
> Somerset Dam is now releasing approximately 12,000 megalitres per day into Wivenhoe Dam, with valves expected remain open until mid-week.
>
>
>
> At North Pine Dam, a release commenced around 8pm last night and is expected to continue until at least early tomorrow morning. Youngs Crossing is inundated.
>
>
>
> Releases from Hinze Dam also commenced last night. Weedons Crossing was inundated prior to the gate release.

>
> A gate release is also continuing from Leslie Harrison Dam, but is expected to cease later on 27 December.
>
>
>
> For recorded information on current dam releases in South East Queensland, members of the public are encouraged to call 1 800 613 122.
>
>
>
> Members of the public seeking information on local flooding impacts, including road closures, should contact the local council.
>
>
>
> Recreation update

>
>
> Both Wivenhoe and Somerset Dams are currently open for water-based recreation activities, however this may change at short notice depending on weather.
>
>
>
> Billies Bay and river access at Atkinsons Crossing at Wivenhoe Dam remain closed.
>
>
>
> All other recreational sites have reopened however this status may change at short notice depending on the weather.
>
>
>

> While some low-lying camp grounds at Wivenhoe have been inundated due to rain, most camping facilities are open, though some are fully booked.
>
>
>
> If further heavy rain occurs, it may be necessary for some camping grounds to close.
>
>
>
> Please contact the operators of the various camping grounds for information regarding each site.
>
>
>
> For further information on the Water Grid: www.watergrid.com.au
<http://www.watergrid.com.au/>
>
>
>
>

ENDS
>
>
>
>
>
>
>
>
> _____
>
> This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
> If not an intended recipient of this email, you must not copy, distribute or take any ction(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
> While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
>
>
>
> +--+
> Think B4U Print
> 1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
> 3 sheets of A4 paper = 1 litre of water
> +--+
>

Lawyers McCullough Robertson

Documents subject to Cabinet confidentiality

To the extent that the following emails are subject to cabinet confidentiality I understand that Crown Law will, on instructions, either produce them to the Commission or take objection to their production. Those documents which are not subject to cabinet confidentiality will be produced by me to the Commission separately.

No	Document	Date	Time
1	Email Duty Engineer to Peter Borrows and others cc Dan Spiller and others – re March 2010 report index	15.01.2011	2.14pm
2	Email Dan Spiller to Duty Engineer re Cabinet in Confidence – discussion points	15.01.2011	2.21pm

Lawyers | McCullough Robertson

Documents subject to Cabinet confidentiality

No	Document	Date	Time
1	Ministerial briefing note – January 2011 flood event and Wivenhoe Dam operations	16.01.2011	
2	Email Dan Spiller to John Bradley and Barry Dennien re Should the Wivenhoe been bigger/Courier Mail Andrew Bolt Blog	16.01.2011	1.09pm
3	Email Peter Borrows to Dan Spiller and others re Cabinet in confidence – ministerial brief outline	16.01.2011	4.28pm
4	Email [redacted] (Bob Reilly) to Dan Spiller and others re Cabinet in confidence – ministerial brief outline	16.01.2011	6.00pm
5	Email John Bradley to Dan Spiller and others re in confidence – ministerial brief – flood event and Wivenhoe Dam	16.01.2011	10.35pm
6	Email Peter Borrows to Barry Dennien and John Bradley cc Dan Spiller and others re public inquiry discussions points – brief – cabinet in confidence	25.01.2011	5.01pm
7	Email Barry Dennien to Peter Borrows and John Bradley cc Dan Spiller and others re public inquiry discussion points – brief – cabinet in confidence	25.01.2011	5.38pm

Dan Spiller

From: Dan Spiller
Sent: Thursday, 6 January 2011 10:35 AM
To: 'Martin.PeterJ[redacted]
Cc: [redacted] 'Best Debbie'
Subject: Wivenhoe Dam releases

[redacted]

Just an early heads up that gate releases will recommence by tomorrow morning. Releases will be relatively minor, at less than one-third of the peak release rate from last week. This means that we will avoid inundating Burtons Bridge and isolating the residents that use it (as always, depending upon any further rainfall). We will inundate Twin Bridges and Savages and Colleges Crossings, which cause inconvenience to a larger number of households.

More details to follow.

Dan

niel Spiller
irector, Operations
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

Dan Spiller

From: Rob Drury [redacted]
Sent: Thursday, 6 January 2011 12:13 PM
To: Dan Spiller
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: Technical Report W28
Attachments: image001.jpg; image002.png; Technical Situation Report W28.docx

Attached Technical Report W28.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

under 400m3/s (Burtons capacity 450m3/s).

If rainfall increases and Lockyer and local runoff also increase, we can close/reduce Wivenhoe accordingly to ensure that that 450m3/s is not exceeded unless necessary.

Councils have been advised of this strategy and are contacting residents.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

TECHNICAL SITUATION REPORT

TSR Number	W28	Date of TSR release	6.1.2011	Time of TSR release	12.00pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Monitor inflows and begin releases later today depending on Lockyer flows	
Strategy	• Monitor and develop release strategy	
Key considerations	Storage levels:	Above FSL
	Inflows:	Ongoing inflows
	Rainfall:	
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	No impact as yet

Rainfall

Since 9am Wednesday, there have been widespread falls of 30mm with isolated heavy falls up to 50mm in the Somerset and Wivenhoe catchments. Totals in the North Pine catchment have generally been below 10mm. Falls up to 60mm were recorded in the Leslie Harrion catchment.

The forecast for the next 24 to 48 hours is for totals up to 150mm in SE Qld.

The catchments remain wet and are likely to generate additional runoff in the event of rain.

Somerset Dam

At 0700 Thursday, Somerset Dam was 99.34m, 0.34m above FSL, and rising slowly. The rain in the Stanley River catchment has produced a small amount of runoff in the upper Stanley but there have been significant rises in Kilcoy Ck. Further regulator operations will be required later Thursday.

Wivenhoe Dam

At 0700 Thursday, Wivenhoe Dam was 67.31m and rising slowly. This is 0.31m above FSL and above the gate trigger level of 67.25m. There have been rises recorded at rivers and stream upstream of Wivenhoe Dam. Gates will be opened in the next 24 hours to manage the inflows from the upper Brisbane River and the outflow from Somerset.

Impacts of Wivenhoe Dam Releases

Based upon rain to date, expecting about 70,000ML from upper Brisbane. Lockyer Ck peak of about 100m3/s Friday afternoon. This will take out Twin Bridges and nearly inundate Savages Crossing. Colleges Crossing could be taken out by a combined Lockyer and local runoff.

Current strategy is to keep Burton Bridge free. On this basis, we will commence opening Wivenhoe at 1800 Thursday and ramp up to about 300m3/s by 2200. This would limit mid Brisbane flows to

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Gate opening

Litsupport Brisbane

From: Dan Spiller
Sent: Thursday, 6 January 2011 1:17 PM
To: stephen.robertson[redacted]
[redacted]u; Best Debbie; 'Martin.PeterJ[redacted]
Cc: Rob Drury; Mike Foster; SEQWGM Media; Reilly Bob
Subject: Recommencement of Wivenhoe Dam gate releases
Attachments: Technical Situation Report W28.docx

All,

We expect to begin gate release from Wivenhoe Dam this evening, to release water accumulated in the dams over the last 24 hours. The technical situation report is attached.

The release rate will be about 25,000 ML/day, compared to the peak last week of about 115,000 ML/day. We will aim to manage releases so as to avoid inundating Burtons Bridge and isolating up to 50 houses. However, depending upon rainfall, the bridge may be inundated by other flows.

The release strategy will be reviewed over the next 24 hours, and may change depending upon the amount of rainfall in the catchment.

We are consulting with Councils and the BoM about the release strategy.

A short media update is being issued, in consultation with the Minister's office.

Please contact me if you require any further information.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

TECHNICAL SITUATION REPORT

TSR Number	W28	Date of TSR release	6.1.2011	Time of TSR release	12.00pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Monitor inflows and begin releases later today depending on Lockyer flows	
Strategy	• Monitor and develop release strategy	
Key considerations	Storage levels:	Above FSL
	Inflows:	Ongoing inflows
	Rainfall:	
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	No impact as yet

Rainfall

Since 9am Wednesday, there have been widespread falls of 30mm with isolated heavy falls up to 50mm in the Somerset and Wivenhoe catchments. Totals in the North Pine catchment have generally been below 10mm. Falls up to 60mm were recorded in the Leslie Harrion catchment.

The forecast for the next 24 to 48 hours is for totals up to 150mm in SE Qld.

The catchments remain wet and are likely to generate additional runoff in the event of rain.

Somerset Dam

At 0700 Thursday, Somerset Dam was 99.34m, 0.34m above FSL, and rising slowly. The rain in the Stanley River catchment has produced a small amount of runoff in the upper Stanley but there have been significant rises in Kilcoy Ck. Further regulator operations will be required later Thursday.

Wivenhoe Dam

At 0700 Thursday, Wivenhoe Dam was 67.31m and rising slowly. This is 0.31m above FSL and above the gate trigger level of 67.25m. There have been rises recorded at rivers and stream upstream of Wivenhoe Dam. Gates will be opened in the next 24 hours to manage the inflows from the upper Brisbane River and the outflow from Somerset.

Impacts of Wivenhoe Dam Releases

Based upon rain to date, expecting about 70,000ML from upper Brisbane. Lockyer Ck peak of about 100m3/s Friday afternoon. This will take out Twin Bridges and nearly inundate Savages Crossing. Colleges Crossing could be taken out by a combined Lockyer and local runoff.

Current strategy is to keep Burton Bridge free. On this basis, we will commence opening Wivenhoe at 1800 Thursday and ramp up to about 300m3/s by 2200. This would limit mid Brisbane flows to just

under 400m3/s (Burtons capacity 450m3/s).

If rainfall increases and Lockyer and local runoff also increase, we can close/reduce Wivenhoe accordingly to ensure that that 450m3/s is not exceeded unless necessary.

Councils have been advised of this strategy and are contacting residents.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Gate opening

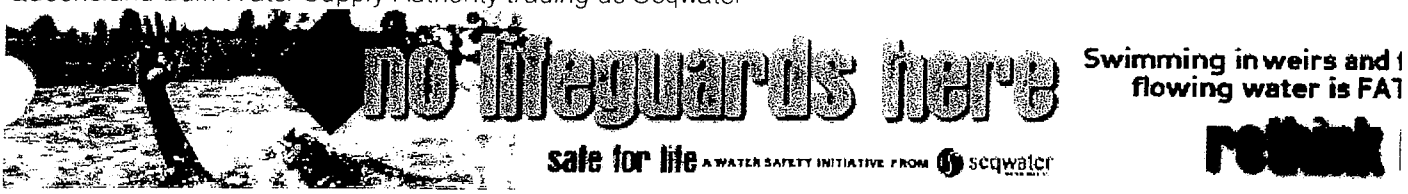
Dan Spiller

From: Rob Drury [redacted]
Sent: Friday, 7 January 2011 6:41 AM
To: Dan Spiller
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W29
Attachments: image001.jpg; image002.png; Technical Situation Report W29.docx

Attached is Report W29

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

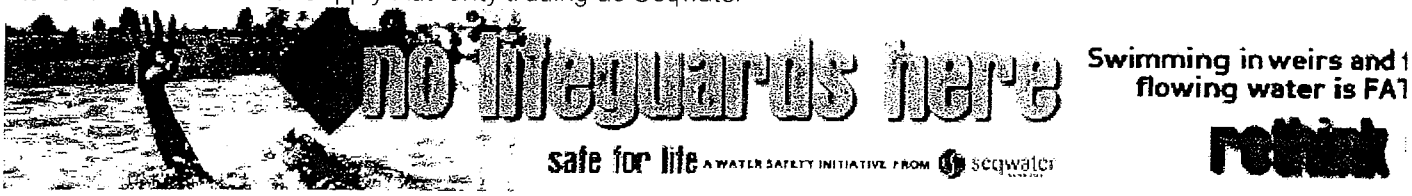
[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Thursday, 6 January 2011 12:13 PM
To: 'Dan Spiller'
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: Technical Report W28

Attached Technical Report W28.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W29	Date of TSR release	7.1.2011	Time of TSR release	7.00am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Monitor inflows and begin releases later today depending on Lockyer flows	
Strategy	• Monitor and develop release strategy, possible Wivenhoe releases later today or early Saturday • Due to high inflows, may need to impact Burtons which could be impacted purely by Lockyer flows later today anyway.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Ongoing inflows
	Rainfall:	
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	No impact as yet

Rainfall

There have been general totals around 30 to 50 mm with isolated heavy falls up to 75mm in the Somerset and Wivenhoe catchments since the event commenced on Wednesday 5 January 2011. There have been significant rainfalls in the Lockyer Ck catchment in the last 72 hours with widespread falls of 50mm and isolated falls up to 100mm.

Totals in the North Pine catchment have generally been about 35mm.

Falls between 20 and 30mm were recorded in the Leslie Harrison catchment.

The forecast for the next five days is for totals between 100 and 200mm in SE Qld. Given the saturated condition of the catchments further runoff will most likely be generated from this rainfall.

North Pine Dam

At 0600 Friday, North Pine Dam was at 39.48m, 0.12m below FSL. Gate operations commenced at 1915 on Thursday 6 January and are expected to continue until at least mid-day Friday 7 January when North Pine Dam is expected to be at 39.40m. These releases have impacted upon Youngs Crossing. Moreton Bay Regional Council was advised and they closed Youngs Crossing prior to gate operations commencing. Based upon the forecast rainfall, gate operations may continue into Saturday, but at this stage it is anticipated that gate operations will cease at around mid-day on Friday 7 January 2011.

Somerset Dam

At 0600 Friday, Somerset Dam was at 99.59m, 0.59m above FSL, and rising slowly. The rain in the Stanley River catchment has produced a small amount of runoff in the Upper Stanley but there have been significant rises in Kilcoy Creek, contributing to the Somerset inflows. Somerset Dam is currently releasing at a rate of 35 cumecs and further regulator/sluice operations will be required in the next 24 to 72 hours.

The estimated event inflow volume into Somerset Dam is around 50,000ML.

Wivenhoe Dam

At 0600 Friday, Wivenhoe Dam was at 67.64m and rising slowly. This is 0.64m above FSL and above the gate trigger level of 67.25m. Upstream of the dam river levels have peaked at the Linville and Gregors Ck gauges. The estimated event inflow volume into Wivenhoe Dam is 230,000ML including Somerset Dam outflow.

A peak of about 470 cumecs is expected from Lockyer Creek by mid-afternoon on Friday 7 January. At this stage there is some uncertainty associated with this estimate but it may be of sufficient magnitude to inundate Burtons Bridge.

Wivenhoe gate releases will occur after the impact of Lockyer flows on Burtons Bridge has been ascertained and flood levels in the lower Lockyer subside. It is proposed that Wivenhoe releases will commence late Friday/early Saturday and may be as high as 1,200 cumecs (similar but slightly smaller to recent events), and the releases are expected to continue over the weekend though to Monday or Tuesday.

Impacts of Downstream of Wivenhoe

Somerset Regional Council, Ipswich City Council and Brisbane City Council have been advised of the potential for gate operations during the next 24 hours.

The relatively high Lockyer flows will adversely impact upon Twin Bridges, Savages Crossing, and Colleges Crossing for several days and may impact upon Burtons Bridge from Friday mid-day and Kholo Bridge later on Friday evening. At this stage, there are not expected to be any adverse impacts upon Fernvale Bridge or Mt Crosby Weir Bridge.

Councils have been advised of this strategy and are contacting residents.

Leslie Harrison Dam

Following the heavy rainfall Wednesday night, gate operations commenced at Leslie Harrison Dam late Wednesday night and are continuing. It is possible operations may cease later today with no further rainfall however, given the forecast rainfall, gate operations are expected to continue for some time.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Gate opening decision

Dan Spiller

From: [redacted]
Sent: Friday, 7 January 2011 8:09 AM
To: Dan Spiller
Subject: FW: Operating Strategy over the next week

Importance: High

FYI

From: Duty Engine[redacted]
Sent: Friday, 7 January 2011 08:05
To: [redacted]; Mike Foster; [redacted] Rob Drury; [redacted] Bill Stephens; [redacted] John.Ruffini[redacted] John Tibaldi; Rob.ayre[redacted] Terry Malone; [redacted] Graham Keegan; [redacted]
Subject: Operating Strategy over the next week
Importance: High

Advice from BoM indicates that SE Qld can expect some high rainfall totals over the next 5 days.

Friday: Rain at times 15-50mm with higher falls along the coast
Saturday: Rain light at times 15-50mm with higher falls along the coast
Sunday: Widespread rain with totals between 50-100mm
Monday: Widespread rain again with totals between 50-100mm
Tuesday: Rain easing with totals between 25-50mm

Given the saturated conditions of the dam catchments, significant volumes of inflows to our dams will be generated.

On this basis, the operating strategy for Somerset, Wivenhoe and North Pine needs to consider the current state of the storages and the project inflows.

North Pine

North Pine currently has 5 gates open releasing runoff from rain on Wed/Thursday. Given the very high likelihood of significant runoff during the next 5 days, it is recommended to keep gates open for the period, rather than opening and closing at various times with short notice. It will not be practical or may not be possible to adopt the usual strategy of opening and closing overnight to minimise the impact on Youngs Crossing.

Somerset

Somerset Dam currently has a regulator open 50%. At this stage, it is expected to open 1 or 2 sluices on Saturday. However, this may need to be reviewed if significant runoff occurs in the Stanley and Upper Brisbane. Under circumstances of high inflows to Somerset and Wivenhoe, it is the usual practice to hold flood water in Somerset until there is a high level of confidence in the estimated inflows to Wivenhoe.

Wivenhoe

As outlined in this morning's SitRep, it is intended to ramp up the release from Wivenhoe to about 1,200m3/s later today. However, given the high likelihood of significant inflows in the next week, this may be increased to 1,500m3/s in order to drain the current temporarily stored flood waters as soon as possible.

This will mean that all of the crossing downstream of Wivenhoe with the exception of Fernvale and Mt Crosby Weir Bridge will be adversely impacted.

Leslie Harrison

Given its proximity to the coast Leslie Harrison is likely to be most impacted by the forecast rain over the next 5 days.

It is likely that the releases from North Pine and Leslie Harrison will continue until the middle of next week and from Wivenhoe until next Friday. Staffing for the Flood Operations Centre will be arranged accordingly. Co-originators should start to plan for prolonged operations at dams.

Terry Malone
Duty Engineer
Flood Operations Centre

[redacted]

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Litsupport Brisbane

From: Dan Spiller
Sent: Friday, 7 January 2011 8:27 AM
To: stephen.robertson[redacted] Best Debbie; 'Martin.Peter[redacted]
Cc: Rob Drury; Mike Foster; SEQWGM Media; Reilly Bob
Subject: Update on dam gate releases
Attachments: Technical Situation Report W29.docx

All,

Attached is the updated technical situation report.

There has been widespread rainfall in most of the dam catchments. These inflows have triggering the need for gate releases, with forecasts of between 100 and 200 mm of further rainfall over the next five days.

'or Wivenhoe and Somerset dams, key points are:

- There has been general falls of around 30 to 50 mm since Wednesday, with isolated peaks of up to 75mm. About 230,000 ML will need to be released, based on estimated flows into the dam.
- There has been heavier rainfall in the Lockyer Creek catchment, which flows into the Brisbane River below the dam wall. Without dam releases, these flows are likely to result in Burtons Bridge being inundated by mid afternoon today – again isolating up to 50 households.
- Dam releases are expected to commence late tonight or early tomorrow, once existing Lockyer Valley flows have peaked – minimising downstream impacts and deferring the inundation of Burtons Bridge.
- At this stage, releases are expected to be at a similar rate to the recent events (up to about 105,000 ML/day) and continue until Monday or Tuesday next week (depending on further rainfall).

North Pine and Leslie Harrison dams are also making gate releases. Youngs Crossing has been inundated.

Councils have been advised. Somerset is contacting key affected residents.

We will provide an update once the timing of releases has been fixed.

lease contact me if you require any further information.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

TECHNICAL SITUATION REPORT

TSR Number	W29	Date of TSR release	7.1.2011	Time of TSR release	7.00am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Monitor inflows and begin releases later today depending on Lockyer flows	
Strategy	• Monitor and develop release strategy, possible Wivenhoe releases later today or early Saturday • Due to high inflows, may need to impact Burtons which could be impacted purely by Lockyer flows later today anyway.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Ongoing inflows
	Rainfall:	
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	No impact as yet

Rainfall

There have been general totals around 30 to 50 mm with isolated heavy falls up to 75mm in the Somerset and Wivenhoe catchments since the event commenced on Wednesday 5 January 2011. There have been significant rainfalls in the Lockyer Ck catchment in the last 72 hours with widespread falls of 50mm and isolated falls up to 100mm.

Totals in the North Pine catchment have generally been about 35mm.

Falls between 20 and 30mm were recorded in the Leslie Harrison catchment.

The forecast for the next five days is for totals between 100 and 200mm in SE Qld. Given the saturated condition of the catchments further runoff will most likely be generated from this rainfall.

North Pine Dam

At 0600 Friday, North Pine Dam was at 39.48m, 0.12m below FSL. Gate operations commenced at 1915 on Thursday 6 January and are expected to continue until at least mid-day Friday 7 January when North Pine Dam is expected to be at 39.40m. These releases have impacted upon Youngs Crossing. Moreton Bay Regional Council was advised and they closed Youngs Crossing prior to gate operations commencing. Based upon the forecast rainfall, gate operations may continue into Saturday, but at this stage it is anticipated that gate operations will cease at around mid-day on Friday 7 January 2011.

Somerset Dam

At 0600 Friday, Somerset Dam was at 99.59m, 0.59m above FSL, and rising slowly. The rain in the Stanley River catchment has produced a small amount of runoff in the Upper Stanley but there have been significant rises in Kilcoy Creek, contributing to the Somerset inflows. Somerset Dam is currently releasing at a rate of 35 cumecs and further regulator/sluice operations will be required in the next 24 to 72 hours.

The estimated event inflow volume into Somerset Dam is around 50,000ML.

Wivenhoe Dam

At 0600 Friday, Wivenhoe Dam was at 67.64m and rising slowly. This is 0.64m above FSL and above the gate trigger level of 67.25m. Upstream of the dam river levels have peaked at the Linville and Gregors Ck gauges. The estimated event inflow volume into Wivenhoe Dam is 230,000ML including Somerset Dam outflow.

A peak of about 470 cumecs is expected from Lockyer Creek by mid-afternoon on Friday 7 January. At this stage there is some uncertainty associated with this estimate but it may be of sufficient magnitude to inundate Burtons Bridge.

Wivenhoe gate releases will occur after the impact of Lockyer flows on Burtons Bridge has been ascertained and flood levels in the lower Lockyer subside. It is proposed that Wivenhoe releases will commence late Friday/early Saturday and may be as high as 1,200 cumecs, (similar but slightly smaller to recent events), and the releases are expected to continue over the weekend though to Monday or Tuesday.

Impacts of Downstream of Wivenhoe

Somerset Regional Council, Ipswich City Council and Brisbane City Council have been advised of the potential for gate operations during the next 24 hours.

The relatively high Lockyer flows will adversely impact upon Twin Bridges, Savages Crossing, and Colleges Crossing for several days and may impact upon Burtons Bridge from Friday mid-day and Kholo Bridge later on Friday evening. At this stage, there are not expected to be any adverse impacts upon Fernvale Bridge or Mt Crosby Weir Bridge.

Councils have been advised of this strategy and are contacting residents.

Leslie Harrison Dam

Following the heavy rainfall Wednesday night, gate operations commenced at Leslie Harrison Dam late Wednesday night and are continuing. It is possible operations may cease later today with no further rainfall however, given the forecast rainfall, gate operations are expected to continue for some time.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Gate opening decision

Dan Spiller

From: Rob Drury [redacted]
Sent: Friday, 7 January 2011 4:05 PM
To: Rob Drury; Dan Spiller
Cc: Peter Borrows [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W30
Attachments: image001.jpg; image002.png; Technical Situation Report W30.docx

Attached is report W30.
Basically advising the first gate is opened at Wivenhoe as at 3.00pm.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

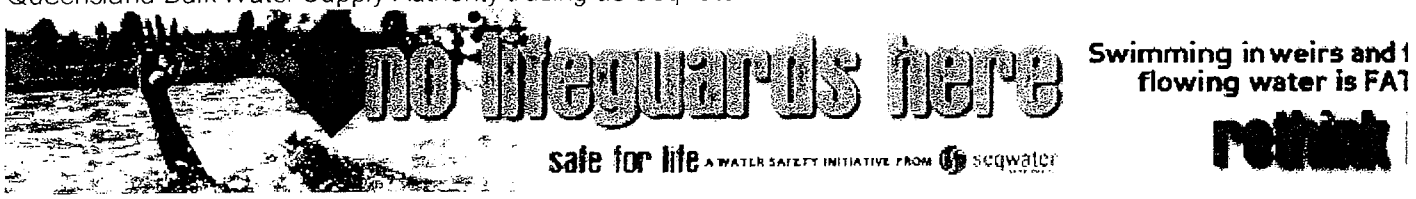
[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
nt: Friday, 7 January 2011 6:41 AM
o: 'Dan Spiller'
Cc: Peter Borrows [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W29

Attached is Report W29

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



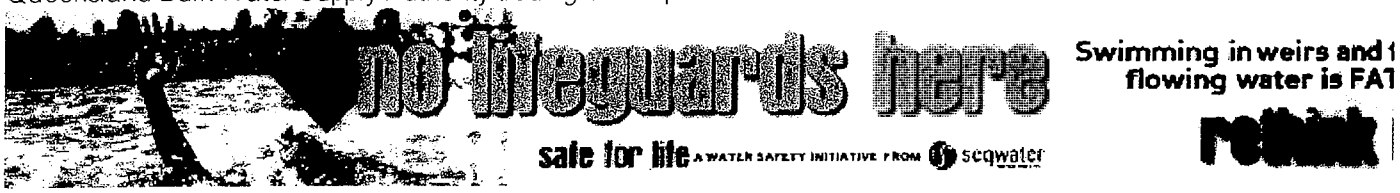
[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Thursday, 6 January 2011 12:13 PM
To: 'Dan Spiller'
Cc: Peter Borrows [redacted] Mike Foster [redacted]
Subject: Technical Report W28

Attached Technical Report W28.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W30	Date of TSR release	7.1.2011	Time of TSR release	3.00pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Begin discharging stored floodwaters	
Strategy	• Start releasing at 3pm today and increase up to 1200cumecs.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Ongoing inflows
	Rainfall:	
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	No impact as yet

North Pine Dam

Ongoing operations.

Somerset Dam

Somerset Dam is currently releasing at a rate of 35 cumecs and further regulator/sluice operations will be required in the next 24 to 72 hours.

The estimated event inflow volume into Somerset Dam is around 50,000ML.

Wivenhoe Dam

Wivenhoe releases commenced at 1500 Friday and will be slowly increased to about 1,200 m3/s by 1400 Saturday. It will initially be held around this level until Sunday morning at which time the release strategy will be reviewed and be dependent upon further rainfall.

Impacts of Downstream of Wivenhoe

This will mean that all of the crossings downstream of Wivenhoe with the exception of Fernvale and Mt Crosby Weir Bridge will be adversely impacted.

Councils have been advised of this strategy and are contacting residents.

Conversations have just taken place between BCC, Seqwater and BoM re impact of flows in the lower Brisbane R

Seqwater and BoM concur that a flow of a 1,500m3/s in the lower Brisbane R will only add about 50mm to the expected water levels in the City Reach on the recorded high tides. This has been demonstrated

by a comparison of the recorded water levels at Whyte Is and Brisbane City gauges during periods of no flow and periods of higher flows in the last few months.

However, it should be noted that this impact varies during the tidal cycle and is more pronounced on the low tide level that the high tide level.

It is recognized that current recorded high tide levels are 0.4 to 0.5 metres higher than predicted tides due to atmospheric conditions.

Leslie Harrison Dam

Following the heavy rainfall Wednesday night, gate operations commenced at Leslie Harrison Dam late Wednesday night and are continuing.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	8.1.2011	Time		or Event	

Litsupport Brisbane

From: Dan Spiller
Sent: Friday, 7 January 2011 4:24 PM
To: stephen.robertson [redacted] Best Debbie; 'Martin.Peter [redacted]
Cc: Rob Drury; Mike Foster; SEQWGM Media; Reilly Bob
Subject: Update on Wivenhoe Dam releases
Attachments: Technical Situation Report W30.docx

All,

Attached is the updated technical situation report.

For Wivenhoe Dam, key points are:

- The first of the gates has opened. The release rate is planned to be increased to about 1,200 m3/s by 1400 Saturday. This is a similar release rate to last week.
- Burtons Bridge is again inundated, isolating some residents.
- Councils have been advised of this strategy and are contacting residents as necessary.
- The releases will have a minimal impact on the level of the Brisbane River in the City Reach. Seqwater and BoM concur that a total flow of a 1,500m3/s adds about 50mm to the expected water levels at that location.
- Due to atmospheric conditions, current recorded high tide levels are 0.4 to 0.5 metres higher than predicted tides.

North Pine and Leslie Harrison dams are also making gate releases. Releases from Hinze Dam are likely to be required over the weekend.

Please contact me if you require any further information.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Visit: Level 19, 33 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated

otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

TECHNICAL SITUATION REPORT

TSR Number	W30	Date of TSR release	7.1.2011	Time of TSR release	3.00pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Begin discharging stored floodwaters	
Strategy	• Start releasing at 3pm today and increase up to 1200cumecs.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Ongoing inflows
	Rainfall:	
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	No impact as yet

North Pine Dam

Ongoing operations.

Somerset Dam

Somerset Dam is currently releasing at a rate of 35 cumecs and further regulator/sluice operations will be required in the next 24 to 72 hours.

The estimated event inflow volume into Somerset Dam is around 50,000ML.

Wivenhoe Dam

Wivenhoe releases commenced at 1500 Friday and will be slowly increased to about 1,200 m3/s by 1400 Saturday. It will initially be held around this level until Sunday morning at which time the release strategy will be reviewed and be dependent upon further rainfall.

Impacts of Downstream of Wivenhoe

This will mean that all of the crossings downstream of Wivenhoe with the exception of Fernvale and Mt Crosby Weir Bridge will be adversely impacted.

Councils have been advised of this strategy and are contacting residents.

Conversations have just taken place between BCC, Seqwater and BoM re impact of flows in the lower Brisbane R

Seqwater and BoM concur that a flow of a 1,500m3/s in the lower Brisbane R will only add about 50mm to the expected water levels in the City Reach on the recorded high tides. This has been demonstrated

by a comparison of the recorded water levels at Whyte Is and Brisbane City gauges during periods of no flow and periods of higher flows in the last few months.

However, it should be noted that this impact varies during the tidal cycle and is more pronounced on the low tide level that the high tide level.

It is recognized that current recorded high tide levels are 0.4 to 0.5 metres higher than predicted tides due to atmospheric conditions.

Leslie Harrison Dam

Following the heavy rainfall Wednesday night, gate operations commenced at Leslie Harrison Dam late Wednesday night and are continuing.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	8.1.2011	**Time**		**or Event**	

Litsupport Brisbane

From: Dan Spiller
Sent: [redacted] 3 PM
To:
Subject: FW: Update on dam gate releases
Attachments: Technical Situation Report W29.docx

Importance: High

Calling to discuss.

From: [redacted] **On Behalf Of** DDC.GoldCoast[redacted]
Sent: Friday, 7 January 2011 3:15 PM
To: Dan Spiller
Cc: DDC.GoldCoast[redacted]
Subject: FW: Update on dam gate releases
Importance: High

Mr Spiller

I am the District Disaster Coordinator for Gold Coast District. In consultation with our District Disaster Management Group representative Mr Michael Short, Department of Environment & Resource Management we are endeavouring to gain a liaison point from your organisation to our group as well as the Local Disaster Management Group and Gold Coast City Council.

We are particularly interested in access to reports of the type attached for our local catchments.

Can you assist with a point of contact?

Regards

[redacted]
Acting Superintendent
District Officer
Gold Coast Police District

[redacted]

Email: [redacted]

Gold Coast, a safe and secure place to live, visit and do business

---

From: [redacted]
Sent: Friday, January 07, 2011 12:01:47 PM
To: DDC[redacted]
Subject: FW: Update on dam gate releases
Auto forwarded by a Rule

[redacted] do we get these for Hinze???

[redacted]
Inspector
District Officer

A great leader's courage to fulfill his vision comes from passion, not position
John Maxwell

[redacted]
Coomera District Police Headquarters
11 De Barnett Street, Coomera Qld
PO BOX 1743 Oxenford Qld 4210
Phone: 5514 7777
Fax: 55147711

safe4life: *safe road users travelling at safe speeds in safe vehicles on safe roads and roadsides.*

From: McDonald.KeithW[MSR]
Sent: Friday, 7 January 2011 9:56 AM
To: [redacted]SER]
Subject: FW: Update on dam gate releases

Steve

Do you get similar for the Hinze and other dams in your area???

Did you send me that link??

Keith McDonald
Inspector
Oxley District
[redacted]

From: [redacted]
Sent: Friday, 7 January 2011 9:51 AM
To: McDonald.KeithW[MSR]
Subject: FW: Update on dam gate releases

Mate are you getting these.

[redacted]
Inspector
Upper Mount Gravatt LAC
South Brisbane District
[redacted]

From: [redacted]
Sent: Friday, 7 January 2011 9:20 AM
To: [redacted]
Subject: FW: Update on dam gate releases

[redacted]
Sent: Friday, 7 January 2011 8:47 AM
To: [redacted]
Cc: [redacted]
Subject: FW: Update on dam gate releases

FYI

[redacted]
Chief Superintendent
Operations Co-Ordinator
Metropolitan South Region

[redacted]

From: Dan Spiller [mailto:[redacted]
Sent: Friday, 7 January 2011 8:27 AM
To: stephen.robertson[redacted] Best Debbie; Martin.Peter[redacted]
Cc: Rob Drury; Mike Foster; SEQWGM Media; Reilly Bob
Subject: Update on dam gate releases

All,

Attached is the updated technical situation report.

There has been widespread rainfall in most of the dam catchments. These inflows have triggering the need for gate releases, with forecasts of between 100 and 200 mm of further rainfall over the next five days.

For Wivenhoe and Somerset dams, key points are:

- There has been general falls of around 30 to 50 mm since Wednesday, with isolated peaks of up to 75mm. About 230,000 ML will need to be released, based on estimated flows into the dam.
- There has been heavier rainfall in the Lockyer Creek catchment, which flows into the Brisbane River below the dam wall. Without dam releases, these flows are likely to result in Burtons Bridge being inundated by mid afternoon today – again isolating up to 50 households.
- Dam releases are expected to commence late tonight or early tomorrow, once existing Lockyer Valley flows have peaked – minimising downstream impacts and deferring the inundation of Burtons Bridge.
- At this stage, releases are expected to be at a similar rate to the recent events (up to about 105,000 ML/day) and continue until Monday or Tuesday next week (depending on further rainfall).

North Pine and Leslie Harrison dams are also making gate releases. Youngs Crossing has been inundated.

Councils have been advised. Somerset is contacting key affected residents.

We will provide an update once the timing of releases has been fixed.

Please contact me if you require any further information.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
****

CONFIDENTIALITY: The information contained in this electronic mail message and any electronic files attached to it may be confidential information, and may also be the subject of legal professional privilege and/or public interest immunity. If you are not the intended recipient you are required to delete it. Any use, disclosure or copying of this message and any attachments is unauthorised. If you have received this electronic message in error, please inform the sender or contact securityscanner@police.qld.gov.au. This footnote also confirms that this email message has been checked for the presence of computer viruses.
****

TECHNICAL SITUATION REPORT

TSR Number	W29	Date of TSR release	7.1.2011	Time of TSR release	7.00am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Monitor inflows and begin releases later today depending on Lockyer flows	
Strategy	• Monitor and develop release strategy, possible Wivenhoe releases later today or early Saturday • Due to high inflows, may need to impact Burtons which could be impacted purely by Lockyer flows later today anyway.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Ongoing inflows
	Rainfall:	
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	No impact as yet

Rainfall

There have been general totals around 30 to 50 mm with isolated heavy falls up to 75mm in the Somerset and Wivenhoe catchments since the event commenced on Wednesday 5 January 2011. There have been significant rainfalls in the Lockyer Ck catchment in the last 72 hours with widespread falls of 50mm and isolated falls up to 100mm.

Totals in the North Pine catchment have generally been about 35mm.

Falls between 20 and 30mm were recorded in the Leslie Harrison catchment.

The forecast for the next five days is for totals between 100 and 200mm in SE Qld. Given the saturated condition of the catchments further runoff will most likely be generated from this rainfall.

North Pine Dam

At 0600 Friday, North Pine Dam was at 39.48m, 0.12m below FSL. Gate operations commenced at 1915 on Thursday 6 January and are expected to continue until at least mid-day Friday 7 January when North Pine Dam is expected to be at 39.40m. These releases have impacted upon Youngs Crossing. Moreton Bay Regional Council was advised and they closed Youngs Crossing prior to gate operations commencing. Based upon the forecast rainfall, gate operations may continue into Saturday, but at this stage it is anticipated that gate operations will cease at around mid-day on Friday 7 January 2011.

Somerset Dam

At 0600 Friday, Somerset Dam was at 99.59m, 0.59m above FSL, and rising slowly. The rain in the Stanley River catchment has produced a small amount of runoff in the Upper Stanley but there have been significant rises in Kilcoy Creek, contributing to the Somerset inflows. Somerset Dam is currently releasing at a rate of 35 cumecs and further regulator/sluice operations will be required in the next 24 to 72 hours.

The estimated event inflow volume into Somerset Dam is around 50,000ML.

Wivenhoe Dam

At 0600 Friday, Wivenhoe Dam was at 67.64m and rising slowly. This is 0.64m above FSL and above the gate trigger level of 67.25m. Upstream of the dam river levels have peaked at the Linville and Gregors Ck gauges. The estimated event inflow volume into Wivenhoe Dam is 230,000ML including Somerset Dam outflow.

A peak of about 470 cumecs is expected from Lockyer Creek by mid-afternoon on Friday 7 January. At this stage there is some uncertainty associated with this estimate but it may be of sufficient magnitude to inundate Burtons Bridge.

Wivenhoe gate releases will occur after the impact of Lockyer flows on Burtons Bridge has been ascertained and flood levels in the lower Lockyer subside. It is proposed that Wivenhoe releases will commence late Friday/early Saturday and may be as high as 1,200 cumecs, (similar but slightly smaller to recent events), and the releases are expected to continue over the weekend though to Monday or Tuesday.

Impacts of Downstream of Wivenhoe

Somerset Regional Council, Ipswich City Council and Brisbane City Council have been advised of the potential for gate operations during the next 24 hours.

The relatively high Lockyer flows will adversely impact upon Twin Bridges, Savages Crossing, and Colleges Crossing for several days and may impact upon Burtons Bridge from Friday mid-day and Kholo Bridge later on Friday evening. At this stage, there are not expected to be any adverse impacts upon Fernvale Bridge or Mt Crosby Weir Bridge.

Councils have been advised of this strategy and are contacting residents.

Leslie Harrison Dam

Following the heavy rainfall Wednesday night, gate operations commenced at Leslie Harrison Dam late Wednesday night and are continuing. It is possible operations may cease later today with no further rainfall however, given the forecast rainfall, gate operations are expected to continue for some time.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Gate opening decision

Litsupport Brisbane

From: Dan Spiller
Sent: Friday, 7 January 2011 4:48 PM
To: [redacted]
Cc: [redacted]
Subject: RE: Update on dam gate releases
Attachments: [redacted].vcf

[redacted]

As discussed, I recommend that Council initially speak to [redacted] about Hinze Dam releases. He can provide an overview of existing processes and status, and the likely arrangements once the upgraded dam is handed over by the Alliance.

I have attached [redacted] details.

Regards,
Dan

From: [redacted] **On Behalf Of** [redacted]
Sent: Friday, 7 January 2011 3:15 PM
To: Dan Spiller
Cc: [redacted]
Subject: FW: Update on dam gate releases
Importance: High

Mr Spiller

I am the District Disaster Coordinator for Gold Coast District. In consultation with our District Disaster Management Group representative Mr [redacted], Department of Environment & Resource Management we are endeavouring to gain a liaison point from your organisation to our group as well as the Local Disaster Management Group and Gold Coast City Council.

We are particularly interested in access to reports of the type attached for our local catchments.

Can you assist with a point of contact?

Regards

[redacted]
Acting Superintendent
District Officer
Gold Coast Police District

[redacted]

Email: [redacted]

Gold Coast, a safe and secure place to live, visit and do business

---

From: [redacted][SER]
Sent: Friday, January 07, 2011 12:01:47 PM
To: DDC.GoldCoast[SER]
Subject: FW: Update on dam gate releases
Auto forwarded by a Rule

H[redacted] do we get these for Hinze???

[redacted]
Inspector
District Officer

A great leader's courage to fulfill his vision comes from passion, not position
John Maxwell

Mobile: [redacted]
E-Mail: [redacted]
Coomera District Police Headquarters
11 De Barnett Street, Coomera Qld
PO BOX 1743 Oxenford Qld 4210
Phone: 5514 7777
Fax: 55147711

safe4life: *safe road users travelling at safe speeds in safe vehicles on safe roads and roadsides.*

From: [redacted]W[MSR]
Sent: Friday, 7 January 2011 9:56 AM
To: [redacted][SER]
Subject: FW: Update on dam gate releases

Steve

Do you get similar for the Hinze and other dams in your area???

Did you send me that link??

[redacted]
Inspector
Oxley District
[redacted]

From: [redacted]
Sent: Friday, 7 January 2011 9:51 AM
To [redacted][MSR]
Subject: FW: Update on dam gate releases

Mate are you getting these.

[redacted]
Inspector

Upper Mount Gravatt LAC
South Brisbane District

[redacted]

From: [redacted]
Sent: Friday, 7 January 2011 9:20 AM
To: [redacted]
Subject: FW: Update on dam gate releases

From: [redacted]
Sent: Friday, 7 January 2011 8:47 AM
To: [redacted]
Cc: [redacted]; RDO Coord MSR; RDO Metro South
Subject: FW: Update on dam gate releases

FYI

[redacted]
Chief Superintendent
Operations Co-Ordinator
Metropolitan South Region

[redacted]

From: Dan Spiller [redacted]
Sent: Friday, 7 January 2011 8:27 AM
To: stephen.robertson [redacted] Best Debbie; Martin.PeterJ[MNR]; [redacted]MSR]
Cc: Rob Drury; Mike Foster; SEQWGM Media; Reilly Bob
Subject: Update on dam gate releases

All,

Attached is the updated technical situation report.

There has been widespread rainfall in most of the dam catchments. These inflows have triggering the need for gate releases, with forecasts of between 100 and 200 mm of further rainfall over the next five days.

For Wivenhoe and Somerset dams, key points are:

- There has been general falls of around 30 to 50 mm since Wednesday, with isolated peaks of up to 75mm. About 230,000 ML will need to be released, based on estimated flows into the dam.
- There has been heavier rainfall in the Lockyer Creek catchment, which flows into the Brisbane River below the dam wall. Without dam releases, these flows are likely to result in Burtons Bridge being inundated by mid afternoon today – again isolating up to 50 households.

- Dam releases are expected to commence late tonight or early tomorrow, once existing Lockyer Valley flows have peaked – minimising downstream impacts and deferring the inundation of Burtons Bridge.
- At this stage, releases are expected to be at a similar rate to the recent events (up to about 105,000 ML/day) and continue until Monday or Tuesday next week (depending on further rainfall).

North Pine and Leslie Harrison dams are also making gate releases. Youngs Crossing has been inundated.

Councils have been advised. Somerset is contacting key affected residents.

We will provide an update once the timing of releases has been fixed.

Please contact me if you require any further information.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
****

CONFIDENTIALITY: The information contained in this electronic mail message and any electronic files attached to it may be confidential information, and may also be the subject of legal professional privilege and/or public interest immunity. If you are not the intended recipient you are required to delete it. Any use, disclosure or copying of this message and any attachments is unauthorised. If you have received this electronic message in error, please inform the sender or contact securityscanner@police.qld.gov.au. This footnote also confirms that this email message has been checked for the presence of computer viruses.
****

Litsupport Brisbane

Full Name: [redacted]
Last Name:
First Name:
Job Title: Senior Communications Advisor
Company: Seqwater

Business Address: Level 3, 240 Margaret St, Brisbane City QLD 4000

PO Box 16146, City East QLD 4002

Business: [redacted]
Mobile:

E-mail: [redacted]
E-mail Display As:

Web Page: www.seqwater.com.au

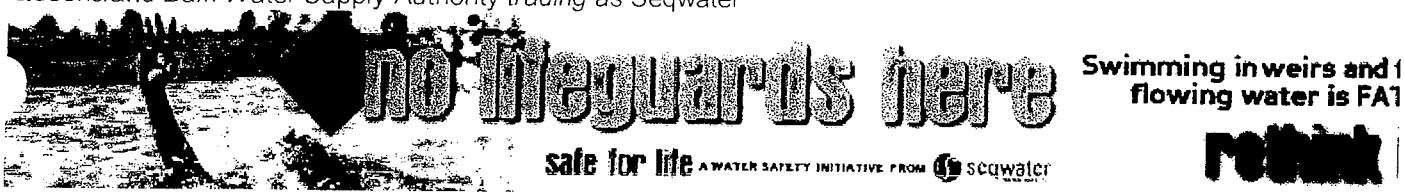
Dan Spiller

From: Rob Drury [redacted]
Sent: Saturday, 8 January 2011 7:46 AM
To: Rob Drury; Dan Spiller
Cc: Peter Borrows; [redacted]; Mike Foster; [redacted]; [redacted]
Subject: RE: Technical Report W31
Attachments: image001.jpg; image002.png; Technical Situation Report W31.docx

Attached report number W31.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any nsmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W31	Date of TSR release	8.1.2011	Time of TSR release	7.00am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue increasing releases to discharge floodwater as quickly as possible	
Strategy	• Continue to increase releases from 890cumecs this morning to 1200cumecs by lunchtime • This should keep Fernvale and Mt Crosby bridges clear however further predicted rainfall may impact.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Ongoing inflows
	Rainfall:	
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Minimal impact as per previous discussions and releases.

Rainfall

Since 0900 Friday, there has been widespread 20 to 40mm throughout North Pine, Somerset and Wivenhoe catchments with isolated higher totals of 70mm in the upper reaches of the Brisbane R. No significant rain has fallen in the past 12 hours.

Advice from BoM indicates that SE Qld can expect further high rainfall totals over the next 4 days.

Saturday: Rain light at times 5-50mm with higher falls along the coast
Sunday: Widespread rain with totals between 50-100mm
Monday: Widespread rain again with totals between 50-100mm
Tuesday: Rain easing with totals between 25-50mm

Given the saturated conditions of the catchments, significant inflows to Seqwater dams will be generated, especially following the forecast rainfall on Sunday/Monday

North Pine (Full Supply Level 39.60 m AHD)

At 0600 Saturday, North Pine Lake Level was 39. 46 m AHD and slowly rising. Currently 3 gates are open to release runoff from rain on Wed/Thursday/Friday. Given the very high likelihood of significant runoff during the next 4 days, gates will be keep open to match inflows over the next few days, rather than opening and closing at various times with short notice. Youngs Crossing will remain adversely impacted for the duration of the gates being open. Moreton Bay Regional Council has been advised and concurs with this strategy.

Somerset (Full Supply Level 99.00 m AHD)

At 0500 Saturday, Somerset Dam level was 100.42m AHD and rising. The Dam is releasing into Wivenhoe through one open sluice gate. Water will be temporarily held in Somerset to allow the inflow from the upper Brisbane is passed through the system. However, this strategy may need to be reviewed if significant runoff occurs in the Stanley and Upper Brisbane. Under circumstances of high inflows to Somerset and Wivenhoe, it is the usual practice to hold flood water in Somerset until there is a high level of confidence in the estimated inflows to Wivenhoe.

Since the commencement of the event on 02/01/2011, approximately 85,000ML has flowed into Somerset Dam with a further 20,000ML expected based on the recorded rainfall to date. Approximately 25,000ML has been released into Wivenhoe.

Wivenhoe (Full Supply Level 67.00 m AHD)

At 0600 Saturday, Wivenhoe Dam was 68.45 m AHD and rising steadily with all five gates open and releasing about 890 m3/s. River levels upstream of Wivenhoe Dam were rising again, generating further inflow to the dam It is intended to ramp up the release from Wivenhoe to 1,200m3/s by midday Saturday 08/01/2011. Further assessments will be undertaken to determine increases above this level. However, given the high likelihood of significant inflows in the next week, this may be increased.

Since the commencement of the event on 02/01/2011, approximately 200,000ML has flowed into Wivenhoe Dam (including Somerset releases) with a further 180,000ML expected based on the recorded rainfall to date. Approximately 50,000ML has been released from Wivenhoe via the hydro and regulator at about 50m3/s.

Impacts downstream of Wivenhoe

The projected Wivenhoe release of 1,200m3/s combined with Lockyer flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing) will be adversely impacted for several days. At this stage Fernvale and Mt Crosby Weir Bridge are not expected to be affected but they could potentially be affected if the predicted rainfall totals eventuate.

The current available assessments indicate that the combined flow in the lower Brisbane R would only add 50mm to an upper limit of 100mm to the recorded water levels in the City Reach of the Brisbane Rive. However, it is noted that tides in the lower Brisbane R will be 0.4 to 0.5 metres higher than predicted tides

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the Wivenhoe operating strategy.

Leslie Harrison Dam

Following the heavy rainfall Wednesday night, gate operations commenced at Leslie Harrison Dam late Wednesday night and are continuing.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Change in strategy

Litsupport Brisbane

From: Dan Spiller
Sent: Saturday, 8 January 2011 9:00 AM
To: stephen.robertso[redacted]
[redacted]
Debbie Best ([redacted] Martin.Peter[redacted]
[redacted]
Cc: Rob Drury [redacted] mfoster[redacted] SEQWGM Media; Damien Brown [redacted]
[redacted]
Subject: Water Grid operations update: 8/1/11
Attachments: Technical Situation Report W31.docx

All,

Dam releases

Attached is the current technical situation report.

Releases are being made from Somerset, Wivenhoe, North Pine and Leslie Harrison dams, with forecasts of high rainfall totals over the next four days.

For Wivenhoe Dam:

- All five gates are now open with the release rate planned to increase to 1200 cubic metres per second by midday today. This release rate is less than peak release from October 2010.
- The release strategy will continue to be reviewed based on actual rainfall. With significant inflows, it may need to be increased.
- As advised yesterday, a number of local birdges have been inundated by releases and local flows. The Fernvale and Mt Crosby Weir Bridges could potentially also be affected if predicted rainfall totals eventuate.
- The BoM and Seqwater concur that current releases will increase the level of the lower Brisbane River by about 50 to 100mm. There is currently a 40 to 50mm atmospheric anomaly.

Releases from North Pine and Leslie Harrison dams are continuing. Releases from Hinze Dam are expected to be required over the weekend.

Water treatment

In terms of operations, Lockyer Valley flows have again caused a turbity spike in the Brisbane River. Impacts are expected to peak today at Mt Crosby today, before being diluted by dam releases. There are similar issues at some other locations.

Despite the spike, all key plants are currently operating within critical limits with any impacts being monitored. Seqwater and Linkwater have prepared for potential issues by increasing treated water storage and staffing at some treatment plants. Desalination is at one-third capacity and ready to increase production within two hours of an instruction (but is unlikely to be required in this event).

With forecast rainfall, these type of issues are likely to recur over the remainder of the wet season.

Please call me on [redacted] you require any further information.

Regards,
Dan

TECHNICAL SITUATION REPORT

TSR Number	W31	Date of TSR release	8.1.2011	Time of TSR release	7.00am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue increasing releases to discharge floodwater as quickly as possible	
Strategy	• Continue to increase releases from 890cumecs this morning to 1200cumecs by lunchtime • This should keep Fernvale and Mt Crosby bridges clear however further predicted rainfall may impact.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Ongoing inflows
	Rainfall:	
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Minimal impact as per previous discussions and releases.

Rainfall

Since 0900 Friday, there has been widespread 20 to 40mm throughout North Pine, Somerset and Wivenhoe catchments with isolated higher totals of 70mm in the upper reaches of the Brisbane R. No significant rain has fallen in the past 12 hours.

Advice from BoM indicates that SE Qld can expect further high rainfall totals over the next 4 days.

Saturday: Rain light at times 5-50mm with higher falls along the coast
Sunday: Widespread rain with totals between 50-100mm
Monday: Widespread rain again with totals between 50-100mm
Tuesday: Rain easing with totals between 25-50mm

Given the saturated conditions of the catchments, significant inflows to Seqwater dams will be generated, especially following the forecast rainfall on Sunday/Monday

North Pine (Full Supply Level 39.60 m AHD)

At 0600 Saturday, North Pine Lake Level was 39. 46 m AHD and slowly rising. Currently 3 gates are open to release runoff from rain on Wed/Thursday/Friday. Given the very high likelihood of significant runoff during the next 4 days, gates will be keep open to match inflows over the next few days, rather than opening and closing at various times with short notice. Youngs Crossing will remain adversely impacted for the duration of the gates being open. Moreton Bay Regional Council has been advised and concurs with this strategy.

Somerset (Full Supply Level 99.00 m AHD)

At 0500 Saturday, Somerset Dam level was 100.42m AHD and rising. The Dam is releasing into Wivenhoe through one open sluice gate. Water will be temporarily held in Somerset to allow the inflow from the upper Brisbane is passed through the system. However, this strategy may need to be reviewed if significant runoff occurs in the Stanley and Upper Brisbane. Under circumstances of high inflows to Somerset and Wivenhoe, it is the usual practice to hold flood water in Somerset until there is a high level of confidence in the estimated inflows to Wivenhoe.

Since the commencement of the event on 02/01/2011, approximately 85,000ML has flowed into Somerset Dam with a further 20,000ML expected based on the recorded rainfall to date. Approximately 25,000ML has been released into Wivenhoe.

Wivenhoe (Full Supply Level 67.00 m AHD)

At 0600 Saturday, Wivenhoe Dam was 68.45 m AHD and rising steadily with all five gates open and releasing about 890 m3/s. River levels upstream of Wivenhoe Dam were rising again, generating further inflow to the dam It is intended to ramp up the release from Wivenhoe to 1,200m3/s by midday Saturday 08/01/2011. Further assessments will be undertaken to determine increases above this level. However, given the high likelihood of significant inflows in the next week, this may be increased.

Since the commencement of the event on 02/01/2011, approximately 200,000ML has flowed into Wivenhoe Dam (including Somerset releases) with a further 180,000ML expected based on the recorded rainfall to date. Approximately 50,000ML has been released from Wivenhoe via the hydro and regulator at about 50m3/s.

Impacts downstream of Wivenhoe

The projected Wivenhoe release of 1,200m3/s combined with Lockyer flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing) will be adversely impacted for several days. At this stage Fernvale and Mt Crosby Weir Bridge are not expected to be affected but they could potentially be affected if the predicted rainfall totals eventuate.

The current available assessments indicate that the combined flow in the lower Brisbane R would only add 50mm to an upper limit of 100mm to the recorded water levels in the City Reach of the Brisbane Rive. However, it is noted that tides in the lower Brisbane R will be 0.4 to 0.5 metres higher than predicted tides

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the Wivenhoe operating strategy.

Leslie Harrison Dam

Following the heavy rainfall Wednesday night, gate operations commenced at Leslie Harrison Dam late Wednesday night and are continuing.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Change in strategy

Dan Spiller

From: Dan Spiller
Sent: Saturday, 8 January 2011 9:48 AM
To: Best Debbie
Subject: RE: Water Grid operations update: 8/1/11

Debbie,

We expect river levels to be similar to yesterday, and again due to tides rather than releases.

River yesterday peaked at about 1.85 metres at the Port Office gauge. The high peak was due almost entirely due to tides and a 0.4 to 0.5 metre atmospheric anomaly.

BoM and Seqwater agree that flows of 1500 cumecs over Mt Crosby will contribute about 0.05m (50mm) to peak river levels at the Port Office gauge. We are planning to release at 1200 cumecs from midday, with an allowance for Lockyer Valley flows (which peaked at about 500 cumecs this week and are reducing). For interest only, the impact on low tide levels is greater - meaning that there is less variation in river levels.

The key risk will be if the high rainfall eventuates (200mm over four days). We will review as this occurs, but in the meantime it is important that we get the flood storage compartment down to give ourselves some flexibility.

Looking forward, we are preparing a more detailed brief on potential scenarios with the upcoming January and February peak tides. The challenge is that river levels are due to about five different factors, of which only tides can be predicted this far out. Atmospheric anomolies can only be predicted a few days out.

Short answer is that we expect ongoing low level flooding (defined by BCC as 1.7m at the Port Office gauge). Moderate Brisbane River flooding as defined by BCC would still require significantly larger releases than have been made at any time since Wivenhoe Dam was completed, potentially combined with another large atmospheric anomoly. Note that local flooding can occur for a range of other reasons, as flagged in the CM today.

Hope this helps.

an

From: Best Debbie [redacted]
Sent: Saturday, 8 January 2011 9:28 AM
To: Dan Spiller
Subject: Fw: Water Grid operations update: 8/1/11

Dan you give detail?
Debbie

----- Original Message -----
From: Ken Smith [redacted]
To: Best Debbie
Sent: Sat Jan 08 09:26:23 2011
Subject: Re: Water Grid operations update: 8/1/11

Thanks Deb. Can't access the attachment at home. Likelihood of localised flooding?

----- Original Message -----
From: Best Debbie [redacted]

To: Ken Smith
Sent: Sat Jan 08 09:16:40 2011
Subject: Fw: Water Grid operations update: 8/1/11

Ken
A bit of action in SE which you need to be aware of. WGM is liaising with the LDMG. Debbie

----- Original Mes[redacted]
From: Dan Spiller [redacted]
To: stephen.robertson[redacted]
[redacted] Best Debbie; Martin.Peter[redacted]
Cc: Rob Drury[redacted]mfoster[redacted]
[redacted]Media @ SEQWGM; Brown Damien; Reilly Bob;
[redacted]
SEQWGM
Sent: Sat Jan 08 08:59:30 2011
Subject: Water Grid operations update: 8/1/11

All,

Dam releases

Attached is the current technical situation report.

Releases are being made from Somerset, Wivenhoe, North Pine and Leslie Harrison dams, with forecasts of high rainfall totals over the next four days.

For Wivenhoe Dam:

* All five gates are now open with the release rate planned to increase to 1200 cubic metres per second by midday today. This release rate is less than peak release from October 2010.
* The release strategy will continue to be reviewed based on actual rainfall. With significant inflows, it may need to be increased.
As advised yesterday, a number of local birdges have been inundated by releases and local flows. The Fernvale and Mt Crosby Weir Bridges could potentially also be affected if predicted rainfall totals eventuate.
* The BoM and Seqwater concur that current releases will increase the level of the lower Brisbane River by about 50 to 100mm. There is currently a 40 to 50mm atmospheric anomaly.

Releases from North Pine and Leslie Harrison dams are continuing. Releases from Hinze Dam are expected to be required over the weekend.

Water treatment

In terms of operations, Lockyer Valley flows have again caused a turbity spike in the Brisbane River. Impacts are expected to peak today at Mt Crosby today, before being diluted by dam releases. There are similar issues at some other locations.

Despite the spike, all key plants are currently operating within critical limits with any impacts being monitored. Seqwater and Linkwater have prepared for potential issues by increasing treated water storage and staffing at some treatment plants. Desalination is at one-third capacity and ready to increase production within two hours of an instruction (but is unlikely to be required in this event).

With forecast rainfall, these type of issues are likely to recur over the remainder of the wet season.

Please call me on [redacted] if you require any further information.

Regards,
Dan

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

+----------+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+----------+

This email is intended only for the addressee. Its use is limited to that intended by the author at the time and it is not to be distributed without the author's consent.

Unless otherwise stated, the State of Queensland accepts no liability for the contents of this email except where subsequently confirmed in writing. The opinions expressed in this email are those of the author and do not necessarily represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.

Leisa McDonald

From: Best Debbie [redacted]
Sent: Saturday, 8 January 2011 10:11 AM
To: Dan Spiller
Subject: Fw: Water Grid operations update: 8/1/11

Fyi

----- Original Message -----
From: Ken Smith [redacted]
To: Best Debbie
Sent: Sat Jan 08 10:09:48 2011
Subject: Re: Water Grid operations update: 8/1/11

Thanks Deb. Let Dan know his analysis was quite helpful.

----- Original Message -----
From: Best Debbie [redacted]
To: Ken Smith
Sent: Sat Jan 08 09:52:47 2011
Subject: Fw: Water Grid operations update: 8/1/11

A summary of impacts

----- Original Message -----
From: Dan Spiller [redacted]
To: Best Debbie
Sent: Sat Jan 08 09:47:48 2011
Subject: RE: Water Grid operations update: 8/1/11

Debbie,

We expect river levels to be similar to yesterday, and again due to tides rather than releases.

River yesterday peaked at about 1.85 metres at the Port Office gauge. The high peak was due almost entirely due to tides and a 0.4 to 0.5 metre atmospheric anomaly.

BoM and Seqwater agree that flows of 1500 cumecs over Mt Crosby will contribute about 0.05m (50mm) to peak river levels at the Port Office gauge. We are planning to release at 1200 cumecs from midday, with an allowance for Lockyer Valley flows (which peaked at about 500 cumecs this week and are reducing). For interest only, the impact on low tide levels is greater - meaning that there is less variation in river levels.

The key risk will be if the high rainfall eventuates (200mm over four days). We will review as this occurs, but in the meantime it is important that we get the flood storage compartment down to give ourselves some flexibility.

Looking forward, we are preparing a more detailed brief on potential scenarios with the upcoming January and February peak tides. The challenge is that river levels are due to about five different factors, of which only tides can be predicted this far out. Atmospheric anomolies can only be predicted a few days out.

Short answer is that we expect ongoing low level flooding (defined by BCC as 1.7m at the Port Office gauge). Moderate Brisbane River flooding as defined by BCC would still require significantly larger releases than have been made at any time since Wivenhoe Dam was completed, potentially combined

with another large atmospheric anomoly. Note that local flooding can occur for a range of other reasons, as flagged in the CM today.

Hope this helps.

Dan

From: Best Debbie [redacted]
Sent: Saturday, 8 January 2011 9:28 AM
To: Dan Spiller
Subject: Fw: Water Grid operations update: 8/1/11

Dan you give detail?
Debbie

----- Original Message -----
From: Ken Smith [redacted]
To: Best Debbie
Sent: Sat Jan 08 09:26:23 2011
Subject: Re: Water Grid operations update: 8/1/11

Thanks Deb. Can't access the attachment at home. Likelihood of localised flooding?

----- Original Message -----
From: Best Debbie [redacted]
To: Ken Smith
Sent: Sat Jan 08 09:16:40 2011
Subject: Fw: Water Grid operations update: 8/1/11

Ken
A bit of action in SE which you need to be aware of. WGM is liaising with the LDMG. Debbie

----- Original Message -----
From: Dan Spiller [redacted]
To: stephen.robertson [redacted] Best Debbie; Martin.Peter [redacted]
Cc: Rob Drury [redacted] Brown Damien; Reilly Bob; [redacted]
Sent: Sat Jan 08 08:59:30 2011
Subject: Water Grid operations update: 8/1/11

All,

Dam releases

Attached is the current technical situation report.

Releases are being made from Somerset, Wivenhoe, North Pine and Leslie Harrison dams, with forecasts of high rainfall totals over the next four days.

For Wivenhoe Dam:

* All five gates are now open with the release rate planned to increase to 1200 cubic metres per second by midday today. This release rate is less than peak release from October 2010.
* The release strategy will continue to be reviewed based on actual rainfall. With significant inflows, it may need to be increased.
* As advised yesterday, a number of local birdges have been inundated by releases and local flows. The Fernvale and Mt Crosby Weir Bridges could potentially also be affected if predicted rainfall totals eventuate.
* The BoM and Seqwater concur that current releases will increase the level of the lower Brisbane River by about 50 to 100mm. There is currently a 40 to 50mm atmospheric anomaly.

Releases from North Pine and Leslie Harrison dams are continuing. Releases from Hinze Dam are expected to be required over the weekend.

Water treatment

In terms of operations, Lockyer Valley flows have again caused a turbity spike in the Brisbane River. Impacts are expected to peak today at Mt Crosby today, before being diluted by dam releases. There are similar issues at some other locations.

Despite the spike, all key plants are currently operating within critical limits with any impacts being monitored. Seqwater and Linkwater have prepared for potential issues by increasing treated water storage and staffing at some treatment plants. Desalination is at one-third capacity and ready to increase production within two hours of an instruction (but is unlikely to be required in this event).

With forecast rainfall, these type of issues are likely to recur over the remainder of the wet season.

Please call me o[redacted] you require any further information.

Regards,
Dan

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

+----------+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+----------+

This email is intended only for the addressee. Its use is limited to that intended by the author at the time and it is not to be distributed without the author's consent.

Unless otherwise stated, the State of Queensland accepts no liability for the contents of this email except where subsequently confirmed in writing. The opinions expressed in this email are those of the author and do not necessarily represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination.
'Jnless stated otherwise, this email represents only the views of the sender and not the views of the SE^ Water Grid Manager and/or the Queensland Government.

This email is intended only for the addressee. Its use is limited to that intended by the author at the time and it is not to be distributed without the author's consent.

Unless otherwise stated, the State of Queensland accepts no liability for the contents of this email except where subsequently confirmed in writing. The opinions expressed in this email are those of the author and do not necessarily represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.

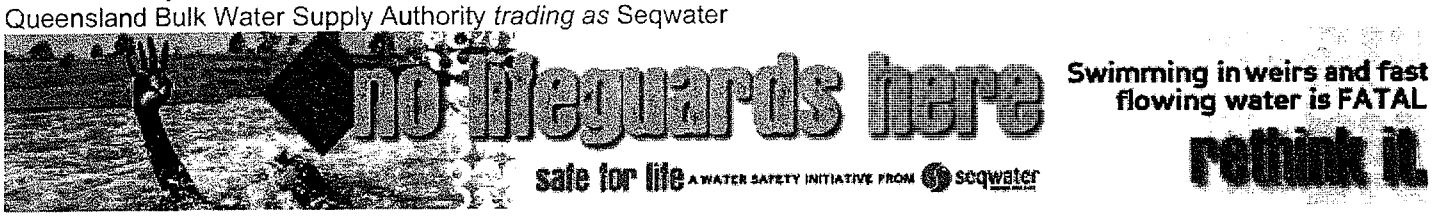
Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Sunday, 9 January 2011 7:50 AM
To: Rob Drury; Dan Spiller
Cc: Peter Borrows [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W31
Attachments: Technical Situation Report W32.docx

Would like to blame the computer system but purely operator error.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Sunday, 9 January 2011 7:26 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W31

Please find attached Report W31.
Basically continuing releases to maintain 1600 cumecs total flow in the mid Brisbane but watching predicted rainfall as the strategy may change. Fernvale and Mt Crosby bridges still should be unaffected but does depend on what rain we get today or tomorrow.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Saturday, 8 January 2011 7:46 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows; [redacted] Mike Foster [redacted]
Subject: RE: Technical Report W31

Attached report number W31.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this

email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W32	Date of TSR release	9.1.2011	Time of TSR release	7.00am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue current releases to discharge floodwater as quickly as possible	
Strategy	• Continue the current releases of around 1350cumecs or 116,000ML per day, however this may change slightly depending on other flows to maintain around 1600cumecs in the mid Brisbane River • This should keep Fernvale and Mt Crosby bridges clear however if further predicted rainfall occurs there may be impacts on these bridges too	
Key considerations	Storage levels:	Above FSL
	Inflows:	Ongoing inflows
	Rainfall:	
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Minimal impact as per previous discussions and releases.

Rainfall

Catchment average rainfall for the past 12 hours is; North Pine Dam (less than 10 mm); Somerset Dam (40 mm); Wivenhoe Dam (less than 10 mm). The bulk of the rain that has fallen in the Somerset Dam catchment has occurred in the last two hours, with recorded falls exceeding 60mm in some areas. The BOM forecast for the next seven days issued at 0450 this morning is:-

Sunday:	Rain periods.
Monday:	Rain periods.
Tuesday:	Rain periods.
Wednesday	A few showers.
Thursday	A shower or two.
Friday	A shower or two.
Saturday	Mostly fine.

A severe whether warning remains current for heavy rainfall in the dam catchment areas. The dam catchments are relatively saturated and significant inflows will be generated if the forecast rainfall eventuates.

North Pine Dam (Full Supply Level 39.60 m AHD)

The dam level is currently 39.47 m AHD and steady. Two radial gates remain open to release runoff generated from recent rainfall. Based on rainfall forecasts, the radial gates have been kept open in anticipation of further inflows over the next few days. However unless significant rain falls today,

consideration will be given to closing the gates late this afternoon or early tomorrow morning and discussions to finalise a decision on the timing of radial gate closure will be held with the Moreton Bay Regional Council later today. Youngs crossing will remain closed while releases are in progress.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is currently falling slowly, with the current level being 100.27m AHD. However the rain that has fallen in the dam catchment over the last two hours (recorded falls exceed 60mm in some areas) will result in significant inflows later today. The current release rate into Wivenhoe Dam is 35,000ML/day. Since the commencement of the event on 02/01/2011approximately 56,000ML has been released from the dam, with a total of at least 150,000ML to be released based on the currently recorded rainfall. The total release for the event is likely to increase significantly over the next few days based on the current rainfall forecasts. At this stage, releases will continue until at least Tuesday.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

The dam level is currently falling slowly, with the current level being 68.58m AHD. River levels upstream of the dam are receding, however further inflows will result from any additional rainfall. The current gate operation strategy will maintain flows of around 1,600m^3/s in the mid-Brisbane River. The current release rate from Wivenhoe Dam is 116,000ML/day. Since the commencement of the event on 02/01/2011approximately 150,000ML has been released from the dam, with a total of at least 450,000ML to be released based on the currently recorded rainfall. The total release for the event is likely to increase over the next few days based on the current rainfall forecasts. At this stage, releases will continue until at least Wednesday.

Impacts downstream of Wivenhoe Dam

The current Wivenhoe Dam release combined with Lockyer flows and local runoff will mean that all low level crossings downstream of Wivenhoe (Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing) will be adversely impacted until at least Wednesday 12 January. At this stage Fernvale and Mt Crosby Weir Bridge are not expected to be affected, but this may be revised if the predicted rainfall totals eventuate and higher releases from Wivenhoe Dam are considered necessary.

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the Wivenhoe operating strategy.

Leslie Harrison Dam

Following the heavy rainfall Wednesday night, gate operations commenced at Leslie Harrison Dam late Wednesday night and closed late last night. However further releases are likely.

Hinze Dam

The gate opening of 300mm continues today and may for several days depending on inflows.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Change in strategy

Litsupport Brisbane

From: [redacted]
Sent: Sunday, 9 January 2011 8:05 AM
To: Dan Spiller; Jade Simmons
Subject: RE: Technical Report W31

Dan

Certainly only planning on updating the 1800 number if there's a significant change.

Cheers,

Paul

From: Dan Spiller [redacted]
Sent: Sunday, 9 January 2011 8:00 AM
To: [redacted]
Cc: [redacted]
Subject: FW: Technical Report W31

[redacted]

Technical report attached.

Media update needs to highlight that the strategy may change based on actual forecasts.

Major changes may mean that we need to do a second update today, but I would prefer to avoid it.

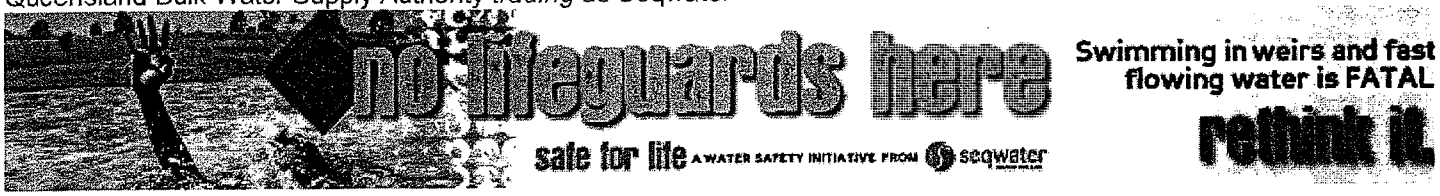
Dan

From: Rob Drury [redacted]
Sent: Sunday, 9 January 2011 7:50 AM
To: Rob Drury; Dan Spiller
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W31

Would like to blame the computer system but purely operator error.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



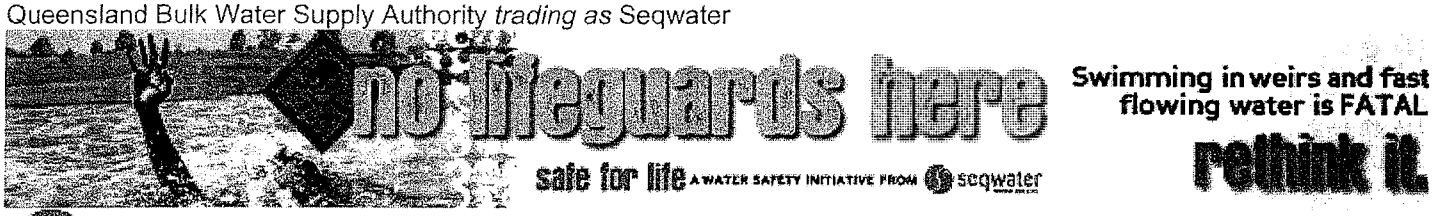
[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Sunday, 9 January 2011 7:26 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows; [redacted] Mike Foster [redacted]
Subject: RE: Technical Report W31

Please find attached Report W31.
Basically continuing releases to maintain 1600 cumecs total flow in the mid Brisbane but watching predicted rainfall as the strategy may change. Fernvale and Mt Crosby bridges still should be unaffected but does depend on what rain we get today or tomorrow.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Saturday, 8 January 2011 7:46 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W31

Attached report number W31.

Rob

Robert Drury
Dam Operations Manager

Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

seqwater
WATER FOR LIFE

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Litsupport Brisbane

From: Dan Spiller
Sent: Sunday, 9 January 2011 8:14 AM
To: stephen.robertson [redacted]

Debbie Best [redacted] Martin.Peter [redacted]

Cc: Rob Drury [redacted] SEQWGM Media; Damien Brown [redacted] bob.reilly [redacted]

Subject: Water Grid operations update: 9/1
Attachments: Technical Situation Report W32.docx

All,

Current technical situation report.

Key points are:

- Wivenhoe Dam is continuing releases at about 116,000 ML/day. Releases are expected to continue until at least Wednesday.
- A severe weather warning remains current for dam catchments. There has been heavy rainfall in the Somerset Dam catchment over the past two hours.
- The release strategy will continue to be reviewed based on actual rainfall.
- Releases are being made so as to avoid inundating the Fernvale and Mt Crosby Weir Bridges. Other flows may impact on the bridges, should the forecast rainfall eventuate.
- North Pine Dam may cease releases today or tomorrow morning, depending upon actual rainfall.
- Many dams and recreation areas are closed.

Please call me on [redacted] if you require any further information.

Regards,
Daniel Spiller

TECHNICAL SITUATION REPORT

TSR Number	W32	Date of TSR release	9.1.2011	Time of TSR release	7.00am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue current releases to discharge floodwater as quickly as possible	
Strategy	• Continue the current releases of around 1350cumecs or 116,000ML per day, however this may change slightly depending on other flows to maintain around 1600cumecs in the mid Brisbane River • This should keep Fernvale and Mt Crosby bridges clear however if further predicted rainfall occurs there may be impacts on these bridges too	
Key considerations	Storage levels:	Above FSL
	Inflows:	Ongoing inflows
	Rainfall:	
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Minimal impact as per previous discussions and releases.

Rainfall

Catchment average rainfall for the past 12 hours is; North Pine Dam (less than 10 mm); Somerset Dam (40 mm); Wivenhoe Dam (less than 10 mm). The bulk of the rain that has fallen in the Somerset Dam catchment has occurred in the last two hours, with recorded falls exceeding 60mm in some areas. The BOM forecast for the next seven days issued at 0450 this morning is:-

Sunday:	Rain periods.
Monday:	Rain periods.
Tuesday:	Rain periods.
Wednesday	A few showers.
Thursday	A shower or two.
Friday	A shower or two.
Saturday	Mostly fine.

A severe whether warning remains current for heavy rainfall in the dam catchment areas. The dam catchments are relatively saturated and significant inflows will be generated if the forecast rainfall eventuates.

North Pine Dam (Full Supply Level 39.60 m AHD)

The dam level is currently 39.47 m AHD and steady. Two radial gates remain open to release runoff generated from recent rainfall. Based on rainfall forecasts, the radial gates have been kept open in anticipation of further inflows over the next few days. However unless significant rain falls today,

consideration will be given to closing the gates late this afternoon or early tomorrow morning and discussions to finalise a decision on the timing of radial gate closure will be held with the Moreton Bay Regional Council later today. Youngs crossing will remain closed while releases are in progress.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is currently falling slowly, with the current level being 100.27m AHD. However the rain that has fallen in the dam catchment over the last two hours (recorded falls exceed 60mm in some areas) will result in significant inflows later today. The current release rate into Wivenhoe Dam is 35,000ML/day. Since the commencement of the event on 02/01/2011approximately 56,000ML has been released from the dam, with a total of at least 150,000ML to be released based on the currently recorded rainfall. The total release for the event is likely to increase significantly over the next few days based on the current rainfall forecasts. At this stage, releases will continue until at least Tuesday.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

The dam level is currently falling slowly, with the current level being 68.58m AHD. River levels upstream of the dam are receding, however further inflows will result from any additional rainfall. The current gate operation strategy will maintain flows of around 1,600m^3/s in the mid-Brisbane River. The current release rate from Wivenhoe Dam is 116,000ML/day. Since the commencement of the event on 02/01/2011approximately 150,000ML has been released from the dam, with a total of at least 450,000ML to be released based on the currently recorded rainfall. The total release for the event is likely to increase over the next few days based on the current rainfall forecasts. At this stage, releases will continue until at least Wednesday.

Impacts downstream of Wivenhoe Dam

The current Wivenhoe Dam release combined with Lockyer flows and local runoff will mean that all low level crossings downstream of Wivenhoe (Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing) will be adversely impacted until at least Wednesday 12 January. At this stage Fernvale and Mt Crosby Weir Bridge are not expected to be affected, but this may be revised if the predicted rainfall totals eventuate and higher releases from Wivenhoe Dam are considered necessary.

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the Wivenhoe operating strategy.

Leslie Harrison Dam

Following the heavy rainfall Wednesday night, gate operations commenced at Leslie Harrison Dam late Wednesday night and closed late last night. However further releases are likely.

Hinze Dam

The gate opening of 300mm continues today and may for several days depending on inflows.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Change in strategy

[redacted]

From: [redacted]
Sent: Sunday, 9 January 2011 8:29 AM
To: Dan Spiller
Cc: [redacted]
Subject: RE: Technical Report W31

Categories: T8

Morning Dan,

If we need to update again later due to changes, not a problem.

Only small amount of media coverage today that states Wivenhoe Dam is open, actually expected more.

[redacted]

From: Dan Spiller
Sent: Sunday, January 09, 2011 8:00 AM
To: [redacted]
Cc: [redacted]
Subject: FW: Technical Report W31

[redacted]

Technical report attached.

Media update needs to highlight that the strategy may change based on actual forecasts.

Major changes may mean that we need to do a second update today, but I would prefer to avoid it.

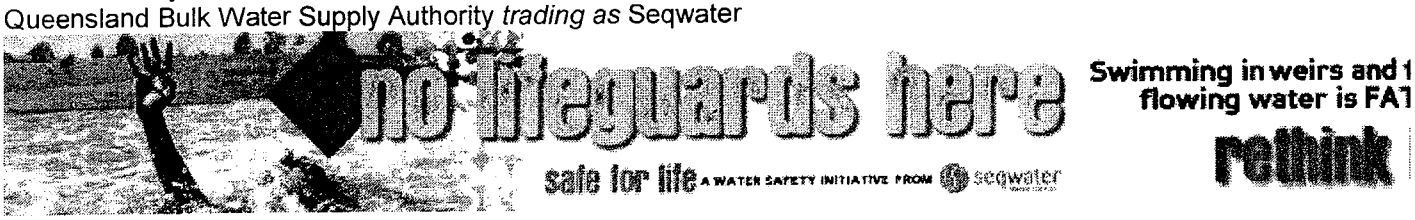
Dan

From: Rob Drury [redacted]
Sent: Sunday, 9 January 2011 7:50 AM
To: Rob Drury; Dan Spiller
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W31

Would like to blame the computer system but purely operator error.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



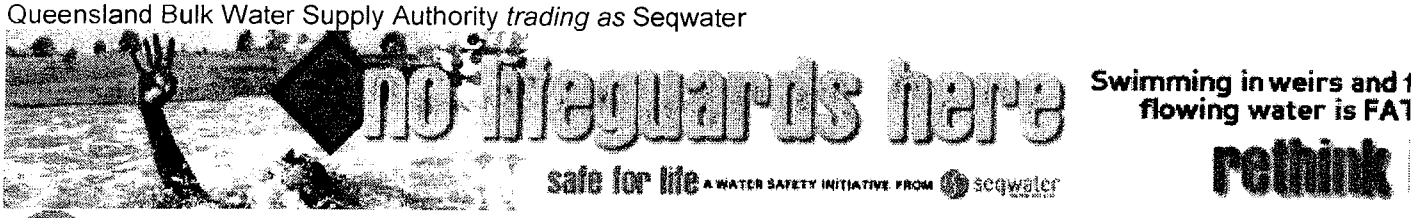
[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Sunday, 9 January 2011 7:26 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows; [redacted]; Mike Foster; [redacted]
Subject: RE: Technical Report W31

Please find attached Report W31.
Basically continuing releases to maintain 1600 cumecs total flow in the mid Brisbane but watching predicted rainfall as the strategy may change. Fernvale and Mt Crosby bridges still should be unaffected but does depend on what rain we get today or tomorrow.

.ob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Saturday, 8 January 2011 7:46 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W31

Attached report number W31.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and f
flowing water is FA1

rethink

seqwater
WATER FOR LIFE

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: [redacted]
Sent: Sunday, 9 January 2011 9:06 AM
To: Dan Spiller; [redacted]
Subject: Media update: dam releases - 9 January 2011

Categories: T8

Hi Dan and [redacted]

Please see below the media update for this morning for your approval/amendment. I have used the word 'spillway' for North Pine Dam, this may be incorrect, Paul - are the gates of North Pine a spillway?

Media update – 9 January 2011

Dam releases

With recent heavy rainfall across South East Queensland and the forecast of more to come, releases are being made from some of the region's water storages. Based on current forecasts, all release operations may change at short notice.

Water from Somerset Dam is being released into Wivenhoe Dam through one gate.

At Wivenhoe Dam, releases commenced during the evening of Thursday 6 January 2011, with all five gates opened by Saturday 8 January 2011. Releases have reached around 116,000 megalitres a day. Gate operations will continue to be reviewed and may change at short notice depending on rainfall, inflows into the dam and river flows.

Wivenhoe Dam releases may impact upon Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing for several days. Local councils should be consulted for detailed information on road crossing closures and other impacts.

At this stage, no impacts are expected for Fernvale Bridge or Mt Crosby Weir Bridge, although this may change depending on rainfall.

These releases are expected to continue until next week, depending upon further rainfall.

Spillway operations at North Pine Dam are being reviewed and may result in the closure of gates later today or tomorrow, however this action is dependent on whether further rainfall is received in the catchment.

Releases from Leslie Harrison Dam have now ceased, however may re-occur at short notice depending on inflows.

Minor releases through the emergency gates of Hinze Dam have commenced.

The Water Grid is continuing to work with local councils regarding the current releases and the likely impacts, which are being managed in accordance with approved flood management plans.

For further information on dam releases please visit www.watergrid.com.au.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

Recreation update

Due to water levels, Wivenhoe Dam and Somerset Dam are closed for all water based recreational activities and is expected to remain closed into next week.

The following recreational sites are currently closed to the public –

- O'Sheas Crossing
- Hamon Cove
- Logan inlet
- Captain Logan Camp
- River access at Atkinson's Crossing
- Billies Bay and Hays Landing
- The Spit
- Lake Somerset Holiday Park Kirkleagh (Boat ramps only)

Other recreation areas at Wivenhoe are open for land based activities. The Spillway Lookout recreation area is open, however visitors are advised that there may be long delays due to the number of people visiting the site. Security staff and traffic controllers will be on site and all visitors will need to follow their directions.

Access to Borumba Dam is currently not available as Yabba Creek Road between Imbil and Borumba Dam is closed.

Lake Baroon has also been closed to all water based recreational activities but is open for picnics and barbeques. Care should be taken at the recreation sites, and vehicles must be parked in designated parking areas only.

Lake Maroon remains closed to water skiing and swimming but remains open to boating and fishing.

Visitors should check the Water Grid website (www.watergrid.com.au) for additional information for each recreation site.

Gold Coast Desalination Plant

Even though the regions dams are at or near full capacity, recent heavy rains have resulted in high sediment levels in the Brisbane River. These increased levels may present challenges for water treatment plants like those at Mt Crosby, which are the main supply for Brisbane.

The Gold Coast Desalination facility was recently brought up to full capacity to address the flood associated issues at Mt Crosby without compromising water security or quality for Brisbane.

The Gold Coast Desalination facility is now operating at 33 per cent capacity to ensure the highest water quality for the South East Queensland region.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils.**

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: [redacted] **Email: media@seqwgm.com.au**



This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: [redacted]
Sent: Sunday, 9 January 2011 9:27 AM
To: [redacted] Dan Spiller
Subject: RE: Media update: dam releases - 9 January 2011

Categories: T8

just changed the Somerset line to read as per your update - 'sluice gates' rather than 'one gate'. will send to media now.

From [redacted]
Sent: Sunday, January 09, 2011 9:26 AM
To: [redacted] Dan Spiller
Subject: Re: Media update: dam releases - 9 January 2011

OK to go

---

rom [redacted]
To: Dan Spiller [redacted]
Cc: [redacted]
Sent: Sun Jan 09 09:18:23 2011
Subject: RE: Media update: dam releases - 9 January 2011

I agree - too many 'depending'. have removed from one of the Wivenhoe lines and re-adjusted the Leslie line - below

---

From: Dan Spiller
Sent: Sunday, January 09, 2011 9:13 AM
To: [redacted]
Subject: RE: Media update: dam releases - 9 January 2011

Looks good. Probably one or two too many dependent on rainfalls.

Dan

From: [redacted]
Sent: Sunday, 9 January 2011 9:06 AM
To: Dan Spiller; [redacted]
Subject: Media update: dam releases - 9 January 2011

Hi Dan and [redacted]

Please see below the media update for this morning for your approval/amendment. I have used the word 'spillway' for North Pine Dam, this may be incorrect, Paul - are the gates of North Pine a spillway?

Media update – 9 January 2011

Dam releases

With recent heavy rainfall across South East Queensland and the forecast of more to come, releases are being made from some of the region's water storages. Based on current forecasts, all release operations may change at short notice.

Water from Somerset Dam is being released into Wivenhoe Dam through one gate.

At Wivenhoe Dam, releases commenced during the evening of Thursday 6 January 2011, with all five gates opened by Saturday 8 January 2011. Releases have reached around 116,000 megalitres a day. Gate operations will continue to be reviewed and may change at short notice depending on rainfall, inflows into the dam and river flows.

Wivenhoe Dam releases may impact upon Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing for several days. Local councils should be consulted for detailed information on road crossing closures and other impacts.

At this stage, no impacts are expected for Fernvale Bridge or Mt Crosby Weir Bridge, although this may change depending on rainfall.

These releases are expected to continue until next week.

Release operations at North Pine Dam are being reviewed and may result in the closure of gates later today or tomorrow, however this action is dependent on whether further rainfall is received in the catchment.

Releases from Leslie Harrison Dam have now ceased, however further inflows received may see gate operations re-occur at short notice.

Minor releases through the emergency gates of Hinze Dam have commenced.

The Water Grid is continuing to work with local councils regarding the current releases and the likely impacts, which are being managed in accordance with approved flood management plans.

For further information on dam releases please visit www.watergrid.com.au.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

Recreation update

Due to water levels, Wivenhoe Dam and Somerset Dam are closed for all water based recreational activities and is expected to remain closed into next week.

The following recreational sites are currently closed to the public –

- O'Sheas Crossing
- Hamon Cove
- Logan inlet
- Captain Logan Camp
- River access at Atkinson's Crossing
- Billies Bay and Hays Landing
- The Spit
- Lake Somerset Holiday Park Kirkleagh (Boat ramps only)

Other recreation areas at Wivenhoe are open for land based activities. The Spillway Lookout recreation area is open, however visitors are advised that there may be long delays due to the number of people visiting the site. Security staff and traffic controllers will be on site and all visitors will need to follow their directions.

Access to Borumba Dam is currently not available as Yabba Creek Road between Imbil and Borumba Dam is closed.

Lake Baroon has also been closed to all water based recreational activities but is open for picnics and barbeques. Care should be taken at the recreation sites, and vehicles must be parked in designated parking areas only.

Lake Maroon remains closed to water skiing and swimming but remains open to boating and fishing.

Visitors should check the Water Grid website (www.watergrid.com.au) for additional information for each recreation site.

Gold Coast Desalination Plant

Even though the regions dams are at or near full capacity, recent heavy rains have resulted in high sediment levels in the Brisbane River. These increased levels may present challenges for water treatment plants like those at Mt Crosby, which are the main supply for Brisbane.

The Gold Coast Desalination facility was recently brought up to full capacity to address the flood associated issues at Mt Crosby without compromising water security or quality for Brisbane.

The Gold Coast Desalination facility is now operating at 33 per cent capacity to ensure the highest water quality for the South East Queensland region.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

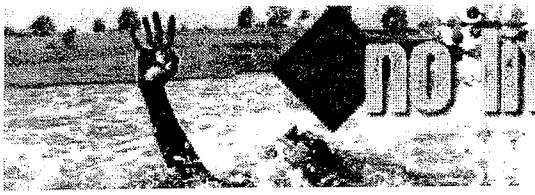
About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: SEQWGM Media
Sent: Sunday, 9 January 2011 9:29 AM
Subject: Media update: dam releases - 9 January 2011

Categories: T8

Media update – 9 January 2011

Dam releases

With recent heavy rainfall across South East Queensland and the forecast of more to come, releases are being made from some of the region's water storages. Based on current forecasts, all release operations may change at short notice.

Water from Somerset Dam is being released into Wivenhoe Dam through the sluice gates.

At Wivenhoe Dam, releases commenced during the evening of Thursday 6 January 2011, with all five gates opened by Saturday 8 January 2011. Releases have reached around 116,000 megalitres a day. Gate operations will continue to be reviewed and may change at short notice depending on rainfall, inflows into the dam and river flows.

Wivenhoe Dam releases may impact upon Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing for several days. Local councils should be consulted for detailed information on road crossing closures and other impacts.

At this stage, no impacts are expected for Fernvale Bridge or Mt Crosby Weir Bridge, although this may change depending on rainfall.

These releases are expected to continue until next week.

Release operations at North Pine Dam are being reviewed and may result in the closure of gates later today or tomorrow, however this action is dependent on whether further rainfall is received in the catchment.

Releases from Leslie Harrison Dam have now ceased, however further inflows received may see gate operations re-occur at short notice.

Minor releases through the emergency gates of Hinze Dam have commenced.

The Water Grid is continuing to work with local councils regarding the current releases and the likely impacts, which are being managed in accordance with approved flood management plans.

For further information on dam releases please visit www.watergrid.com.au.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils.**

Recreation update

Due to water levels, Wivenhoe Dam and Somerset Dam are closed for all water based recreational activities and is expected to remain closed into next week.

The following recreational sites are currently closed to the public –

- O'Sheas Crossing
- Hamon Cove
- Logan inlet
- Captain Logan Camp
- River access at Atkinson's Crossing
- Billies Bay and Hays Landing
- The Spit
- Lake Somerset Holiday Park Kirkleagh (Boat ramps only)

Other recreation areas at Wivenhoe are open for land based activities. The Spillway Lookout recreation area is open, however visitors are advised that there may be long delays due to the number of people visiting the site. Security staff and traffic controllers will be on site and all visitors will need to follow their directions.

Access to Borumba Dam is currently not available as Yabba Creek Road between Imbil and Borumba Dam is closed.

Lake Baroon has also been closed to all water based recreational activities but is open for picnics and barbeques. Care should be taken at the recreation sites, and vehicles must be parked in designated parking areas only.

Lake Maroon remains closed to water skiing and swimming but remains open to boating and fishing.

Visitors should check the Water Grid website (www.watergrid.com.au) for additional information for each recreation site.

Gold Coast Desalination Plant

Even though the regions dams are at or near full capacity, recent heavy rains have resulted in high sediment levels in the Brisbane River. These increased levels may present challenges for water treatment plants like those at Mt Crosby, which are the main supply for Brisbane.

The Gold Coast Desalination facility was recently brought up to full capacity to address the flood associated issues at Mt Crosby without compromising water security or quality for Brisbane.

The Gold Coast Desalination facility is now operating at 33 per cent capacity to ensure the highest water quality for the South East Queensland region.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: [redacted] **Email: media@seqwgm.com.au**



This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: SEQWGM Media
Sent: Sunday, 9 January 2011 11:43 AM
To: [redacted]
Subject: FW: Media update: dam releases - 9 January 2011

Categories: T8

Hi [redacted]

As discussed, please find below the Water Grid's dam release update, sent this morning.

Regards

[redacted]
SEQ Water Grid Communications Unit
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

From: SEQWGM Media
Sent: Sunday, January 09, 2011 9:29 AM
Subject: TRIM: Media update: dam releases - 9 January 2011

Media update – 9 January 2011

Dam releases

With recent heavy rainfall across South East Queensland and the forecast of more to come, releases are being made from some of the region's water storages. Based on current forecasts, all release operations may change at short notice.

Water from Somerset Dam is being released into Wivenhoe Dam through the sluice gates.

At Wivenhoe Dam, releases commenced during the evening of Thursday 6 January 2011, with all five gates opened by Saturday 8 January 2011. Releases have reached around 116,000 megalitres a day. Gate operations will continue to be reviewed and may change at short notice depending on rainfall, inflows into the dam and river flows.

Wivenhoe Dam releases may impact upon Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing for several days. Local councils should be consulted for detailed information on road crossing closures and other impacts.

At this stage, no impacts are expected for Fernvale Bridge or Mt Crosby Weir Bridge, although this may change depending on rainfall.

These releases are expected to continue until next week.

Release operations at North Pine Dam are being reviewed and may result in the closure of gates later today or tomorrow, however this action is dependent on whether further rainfall is received in the catchment.

Releases from Leslie Harrison Dam have now ceased, however further inflows received may see gate operations re-occur at short notice.

Minor releases through the emergency gates of Hinze Dam have commenced.

The Water Grid is continuing to work with local councils regarding the current releases and the likely impacts, which are being managed in accordance with approved flood management plans.

For further information on dam releases please visit www.watergrid.com.au.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

Recreation update

Due to water levels, Wivenhoe Dam and Somerset Dam are closed for all water based recreational activities and is expected to remain closed into next week.

The following recreational sites are currently closed to the public –

- O'Sheas Crossing
- Hamon Cove
- Logan inlet
- Captain Logan Camp
- River access at Atkinson's Crossing
- Billies Bay and Hays Landing
- The Spit
- Lake Somerset Holiday Park Kirkleagh (Boat ramps only)

Other recreation areas at Wivenhoe are open for land based activities. The Spillway Lookout recreation area is open, however visitors are advised that there may be long delays due to the number of people visiting the site. Security staff and traffic controllers will be on site and all visitors will need to follow their directions.

Access to Borumba Dam is currently not available as Yabba Creek Road between Imbil and Borumba Dam is closed.

Lake Baroon has also been closed to all water based recreational activities but is open for picnics and barbeques. Care should be taken at the recreation sites, and vehicles must be parked in designated parking areas only.

Lake Maroon remains closed to water skiing and swimming but remains open to boating and fishing.

Visitors should check the Water Grid website (www.watergrid.com.au) for additional information for each recreation site.

Gold Coast Desalination Plant

Even though the regions dams are at or near full capacity, recent heavy rains have resulted in high sediment levels in the Brisbane River. These increased levels may present challenges for water treatment plants like those at Mt Crosby, which are the main supply for Brisbane.

The Gold Coast Desalination facility was recently brought up to full capacity to address the flood associated issues at Mt Crosby without compromising water security or quality for Brisbane.

The Gold Coast Desalination facility is now operating at 33 per cent capacity to ensure the highest water quality for the South East Queensland region.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils.**

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: SEQWGM Media
Sent: Sunday, 9 January 2011 11:50 AM
To: Dan Spiller
Subject: Fwd: Media update: dam releases - 9 January 2011

Categories: T8

Hi Dan,

Seven have also asked whether this infomation will be relevant for news time. I have explained that if there are significant changes, we will inform all media, otherwise information contained in this mornings update will be still current.

There was no request for an interview, though he did ask if he could call back.

[redacted]

ent from my iPhone

Begin forwarded message:

From: SEQWGM Media [redacted]
Date: 9 January 2011 11:43:06 AM GMT+10:00
To: [redacted]
Subject: FW: Media update: dam releases - 9 January 2011

Hi Geoff,

As discussed, please find below the Water Grid's dam release update, sent this morning.

Regards

[redacted]

SEQ Water Grid Communications Unit

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

From: SEQWGM Media
Sent: Sunday, January 09, 2011 9:29 AM
Subject: TRIM: Media update: dam releases - 9 January 2011

Media update – 9 January 2011

Dam releases

With recent heavy rainfall across South East Queensland and the forecast of more to come, releases are being made from some of the region's water storages. Based on current forecasts, all release operations may change at short notice.

Water from Somerset Dam is being released into Wivenhoe Dam through the sluice gates.

At Wivenhoe Dam, releases commenced during the evening of Thursday 6 January 2011, with all five gates opened by Saturday 8 January 2011. Releases have reached around 116,000 megalitres a day. Gate operations will continue to be reviewed and may change at short notice depending on rainfall, inflows into the dam and river flows.

Wivenhoe Dam releases may impact upon Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing for several days. Local councils should be consulted for detailed information on road crossing closures and other impacts.

At this stage, no impacts are expected for Fernvale Bridge or Mt Crosby Weir Bridge, although this may change depending on rainfall.

These releases are expected to continue until next week.

Release operations at North Pine Dam are being reviewed and may result in the closure of gates later today or tomorrow, however this action is dependent on whether further rainfall is received in the catchment.

Releases from Leslie Harrison Dam have now ceased, however further inflows received may see gate operations re-occur at short notice.

Minor releases through the emergency gates of Hinze Dam have commenced.

The Water Grid is continuing to work with local councils regarding the current releases and the likely impacts, which are being managed in accordance with approved flood management plans.

For further information on dam releases please visit www.watergrid.com.au.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

Recreation update

Due to water levels, Wivenhoe Dam and Somerset Dam are closed for all water based recreational activities and is expected to remain closed into next week.

The following recreational sites are currently closed to the public –

- O'Sheas Crossing
- Hamon Cove
- Logan inlet
- Captain Logan Camp
- River access at Atkinson's Crossing
- Billies Bay and Hays Landing
- The Spit
- Lake Somerset Holiday Park Kirkleagh (Boat ramps only)

Other recreation areas at Wivenhoe are open for land based activities. The Spillway Lookout recreation area is open, however visitors are advised that there may be long delays due to the number of people visiting the site. Security staff and traffic controllers will be on site and all visitors will need to follow their directions.

Access to Borumba Dam is currently not available as Yabba Creek Road between Imbil and Borumba Dam is closed.

Lake Baroon has also been closed to all water based recreational activities but is open for picnics and barbeques. Care should be taken at the recreation sites, and vehicles must be parked in designated parking areas only.

Lake Maroon remains closed to water skiing and swimming but remains open to boating and fishing.

Visitors should check the Water Grid website (www.watergrid.com.au) for additional information for each recreation site.

Gold Coast Desalination Plant

Even though the regions dams are at or near full capacity, recent heavy rains have resulted in high sediment levels in the Brisbane River. These increased levels may present challenges for water treatment plants like those at Mt Crosby, which are the main supply for Brisbane.

The Gold Coast Desalination facility was recently brought up to full capacity to address the flood associated issues at Mt Crosby without compromising water security or quality for Brisbane.

The Gold Coast Desalination facility is now operating at 33 per cent capacity to ensure the highest water quality for the South East Queensland region.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils.**

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from

this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: SEQWGM Media
Sent: Sunday, 9 January 2011 4:04 PM
To: [redacted]
Subject: Fwd: Media update: dam releases - 9 January 2011
Attachments: cidimage001.gif@01CB873F.38F327A0; ATT00001.htm

Categories: T8

Hi [redacted]

Please find below the Water Grid's dam release update, sent this morning. The information contained in this update is still current.

Regards

[redacted]

SEQ Water Grid Communications Unit

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

From: SEQWGM Media
Sent: Sunday, January 09, 2011 9:29 AM
Subject: TRIM: Media update: dam releases - 9 January 2011

Media update – 9 January 2011

Dam releases

With recent heavy rainfall across South East Queensland and the forecast of more to come, releases are being made from some of the region's water storages. Based on current forecasts, all release operations may change at short notice.

Water from Somerset Dam is being released into Wivenhoe Dam through the sluice gates.

At Wivenhoe Dam, releases commenced during the evening of Thursday 6 January 2011, with all five gates opened by Saturday 8 January 2011. Releases have reached around 116,000 megalitres a day. Gate operations will continue to be reviewed and may change at short notice depending on rainfall, inflows into the dam and river flows.

Wivenhoe Dam releases may impact upon Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing for several days. Local councils should be consulted for detailed information on road crossing closures and other impacts.

At this stage, no impacts are expected for Fernvale Bridge or Mt Crosby Weir Bridge, although this may change depending on rainfall.

These releases are expected to continue until next week.

Release operations at North Pine Dam are being reviewed and may result in the closure of gates later today or tomorrow, however this action is dependent on whether further rainfall is received in the catchment.

Releases from Leslie Harrison Dam have now ceased, however further inflows received may see gate operations re-occur at short notice.

Minor releases through the emergency gates of Hinze Dam have commenced.

The Water Grid is continuing to work with local councils regarding the current releases and the likely impacts, which are being managed in accordance with approved flood management plans.

For further information on dam releases please visit www.watergrid.com.au.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils.**

Recreation update

Due to water levels, Wivenhoe Dam and Somerset Dam are closed for all water based recreational activities and is expected to remain closed into next week.

The following recreational sites are currently closed to the public –

- O'Sheas Crossing
- Hamon Cove
- Logan inlet
- Captain Logan Camp
- River access at Atkinson's Crossing
- Billies Bay and Hays Landing
- The Spit
- Lake Somerset Holiday Park Kirkleagh (Boat ramps only)

Other recreation areas at Wivenhoe are open for land based activities. The Spillway Lookout recreation area is open, however visitors are advised that there may be long delays due to the number of people visiting the site. Security staff and traffic controllers will be on site and all visitors will need to follow their directions.

Access to Borumba Dam is currently not available as Yabba Creek Road between Imbil and Borumba Dam is closed.

Lake Baroon has also been closed to all water based recreational activities but is open for picnics and barbeques. Care should be taken at the recreation sites, and vehicles must be parked in designated parking areas only.

Lake Maroon remains closed to water skiing and swimming but remains open to boating and fishing.

Visitors should check the Water Grid website (www.watergrid.com.au) for additional information for each recreation site.

Gold Coast Desalination Plant

Even though the regions dams are at or near full capacity, recent heavy rains have resulted in high sediment levels in the Brisbane River. These increased levels may present challenges for water treatment plants like those at Mt Crosby, which are the main supply for Brisbane.

The Gold Coast Desalination facility was recently brought up to full capacity to address the flood associated issues at Mt Crosby without compromising water security or quality for Brisbane.

The Gold Coast Desalination facility is now operating at 33 per cent capacity to ensure the highest water quality for the South East Queensland region.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Sunday, 9 January 2011 6:13 PM
To: Dan Spiller
Subject: RE: Technical Report W31

Will send an update in next hour or so.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Dan Spiller [redacted]
Sent: Sunday, 9 January 2011 4:43 PM
To: Rob Drury
Subject: Re: Technical Report W31

Thanks. Appreciate any advice, especially from BCC about city flooding. Anticipate we may get asked soon.

Dan

On 09/01/2011, at 4:28 PM, "Rob Drury" [redacted] wrote:

> Not yet. Duty engineers meeting this afternoon to discuss strategies. Will advise if any change but you are right, we are getting big inflows. Rob
>
> ---
>
> **From**: Dan Spiller [redacted]
> **To**: Rob Drury
> **Sent**: Sun Jan 09 16:19:14 2011
> **Subject**: Re: Technical Report W31

Rob,

Seems to have been a lot of rain in the catchments, and more heading for Bris Any changes to strategy?

Dan

On 09/01/2011, at 7:50 AM, "Rob Drury" [redacted] wrote:

> Would like to blame the computer system but purely operator error.
>
> Rob
>
> **Robert Drury**
>
> Dam Operations Manager
>
> Water Delivery
>
> Queensland Bulk Water Supply Authority *trading as* Seqwater
>
> <image001.jpg>
>
> <image002.png>
>
> [redacted]
>
> Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
> PO Box 37, Fernvale QLD 4306
>
> Website | www.seqwater.com.au

From: Rob Drury
Sent: Sunday, 9 January 2011 7:26 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows; [redacted]; Mike Foster [redacted]
Subject: RE: Technical Report W31

Please find attached Report W31.

Basically continuing releases to maintain 1600 cumecs total flow in the mid Brisbane but watching predicted rainfall as the strategy may change. Fernvale and Mt Crosby bridges still should be unaffected but does depend on what rain we get today or tomorrow.

Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.jpg>

<image002.png>

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

From: Rob Drury
Sent: Saturday, 8 January 2011 7:46 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W31

Attached report number W31.

Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.jpg>

<image002.png>

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

<Technical Situation Report W32.docx>

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

From: Dan Spiller [redacted]
Sent: Sunday, 9 January 2011 8:29 PM
To: Martin.Peter [redacted]
Subject: Pls call me this evening on [redacted]

Peter or [redacted]

Please call me. Unfortunately my remote login system is not calling up your phone numbers.

We are receiving very large inflows into storages and will need to increase releases. We are reviewing the strategy and intend to distribute advice tonight. I would appreciate a conversation about how you wish to be involved tonight.

The releases will certainly inundate the Mt Crosby Weir Bridge and Fernvale Bridge. The question at present is the timing, and therefore the time that we have to advise residents. Initial advice is that it could be from midday.

Regards,
Dan

[redacted]

From: Dan Spiller
Sent: Sunday, 9 January 2011 8:56 PM
To: 'Rob Drury'
Subject: Update

Categories: T8

Rob,

How are you tracking?

We are proposing to have a short teleconference tonight to start planning for impacts and communication. I also need to advise upwards.

Dan

[redacted]

From: [redacted]
Sent: Sunday, 9 January 2011 9:15 PM
To: Dan Spiller [redacted] Barry Dennien [redacted]
Subject: Our teleconference number

Categories: T8

Gents

Our teleconference number is:

[redacted] The:

a. if you are setting up the call, you enter the PIN [redacted] – this will start the teleconference

b. If you (or someone else) is a guest to the call, you enter the PIN [redacted] – this will allow you to join the initiated teleconference

Cheers

[redacted]
Director Risk and Technology
SEQ Water Grid Manager
[redacted]
Post: PO Box 16205, BRISBANE CITY EAST, QLD 4002
Visit: Level 15, 53 Albert St, BRISBANE
ABN: 14783 317 630

[redacted]

From: Dan Spiller
Sent: Sunday, 9 January 2011 9:16 PM
To: [redacted]
Subject: FW: Darren, please call me on [redacted]

Categories: T8

Darren,

Cancel that. I just spoke to Peter.

We will be sending through an updated strategy.

Regards,
Dan

From: Dan Spiller
Sent: Sunday, January 09, 2011 9:11 PM
To: [redacted]
Subject: [redacted] please call me on [redacted]

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Sunday, 9 January 2011 9:18 PM
To: Rob Drury; Dan Spiller
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W34
Attachments: Technical Situation Report W34.docx

See attached report W34.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Sunday, 9 January 2011 7:26 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W31

Please find attached Report W31.
Basically continuing releases to maintain 1600 cumecs total flow in the mid Brisbane but watching predicted rainfall as the strategy may change. Fernvale and Mt Crosby bridges still should be unaffected but does depend on what rain we get today or tomorrow.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Saturday, 8 January 2011 7:46 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows; [redacted] Mike Foster [redacted]
Subject: RE: Technical Report W31

Attached report number W31.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this

email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W34	Date of TSR release	9.1.2011	Time of TSR release	9.00pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue current releases however event is increasing in magnitude and will require increased releases.	
Strategy	• Continue the current releases until tomorrow noon when re4leases will be increased to impact Mt Crosby and Fernvale Bridges.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows may approach 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Very heavy rainfall has been recorded in the upper reaches of the Brisbane and Stanley in the last 6 hours with totals up 100 to 140mm. Totals for the last 24 hours range from 100 to 300mm.

Rainfall of similar magnitudes is expected in the 12 to 24 hours, especially around the Bremer/Warrill catchments as the system tracks south.

A severe weather warning remains current for heavy rainfall in the dam catchment areas.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 101.68 m AHD (about 500,000ML currently in storage) and rising quickly. Peak inflow to the dam is estimated to be about 4,000 m3/s based on observed rainfall and could be as high as 5,000m3/s with additional forecast rainfall. Five sluice gates are open releasing about 1,100m3/s (95,000Ml/d) into Wivenhoe Dam. At this stage the dam will reach at least 103.5 early Tuesday morning which will adversely impact areas around Kilcoy.

Since the commencement of the event on 02/01/2011approximately 100,000ML has been released from the dam into Wivenhoe, with an event total of the order of 520,000ML expected. This may increase due to the forecast rain in the next 24 to 48 hours. At this stage, releases will continue until at least Thursday.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

River levels upstream of the dam are rising quickly with significant inflow being generated from the intense heavy rainfall. Flows in the Brisbane River at Gregor's Ck have already reached 6,700m3/s and the river is still rising.

The dam level is rising again, with the current level being 69.10m AHD (1,410,000ML with about 300,00 of flood storage). Estimated peak inflow to the dam just from the Upper Brisbane R alone may reach as high as 7,500m3/s and, at this stage, the dam will reach at least 73.0 m AHD during Tuesday morning. Given the rapid increase in inflow volumes, it will be necessary to increase the release from Wivenhoe Monday morning.

The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam and, at this stage, releases will be kept below 3,500m3/s and the combined flows is the lower Brisbane will be limited to 4,000m3/s. This is below the limit of urban damages in the City reaches.

The current release rate from Wivenhoe Dam is 1,400m3/s (120,000ML/day). Gate opening will start to be increased from noon Monday and the release is expected increase to at least 2,600m3/s during Tuesday moming.

Since the commencement of the event on 02/01/2011 approximately 220,000ML has been released from the dam, with an event total approaching 1,000,000ML without further rain and as much as 1,500,000ML with forecast rainfall of (both including Somerset outflow). At this stage, releases will continue until at least Sunday 16th January 2011.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Saturday 15 January in varying degrees.

Water levels in the lower Brisbane R will be impacted by the combined flows of Lockyer Ck, Bremer River, local runoff and releases from Wivenhoe Dam.

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the updated Wivenhoe operating strategy.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	[redacted].au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	10.1.2011	Time		or Event	Change in strategy

[redacted]

From: [redacted]
Sent: Sunday, 9 January 2011 9:20 PM
To: [redacted] Dan Spiller
Cc: SEQWGM Media
Subject: Media update: Wivenhoe Dam releases - 9 January 2011 - evening

Categories: T8

Hi [redacted] and Dan,

Here is a draft for if/when we need it. Check 3rd line in particular, not sure if this is operationally correct?

Media update – 9/10 January 2011

Wivenhoe Dam releases

Due to heavy rainfall received across South East Queensland today/ yesterday, releases from Wivenhoe Dam have been/ will be temporarily increased.

Releases have reached around XXX,000 megalitres a day and may impact Fernvale Bridge and Mt Crosby Weir Bridge, Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing.

It is expected that releases will be decreased once the flood storage compartment lowers.

Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

Litsupport Brisbane

From: Dan Spiller
Sent: Sunday, 9 January 2011 9:27 PM
To: 'Rob Drury'; Barry Dennien; [redacted] SEQWGM Media; Debbie Best
[redacted]
Subject: FW: Technical Report W34
Attachments: Technical Situation Report W34.docx

Technical report below.

Teleconference at 9.30.

Details are:

Phon [redacted]
PIN:

Regards,
Dan

From: Rob Drury [redacted]
Sent: Sunday, January 09, 2011 9:18 PM
To: Rob Drury; Dan Spiller
Cc: Peter Borrows; [redacted] Mike Foster [redacted]
Subject: RE: Technical Report W34

See attached report W34.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Sunday, 9 January 2011 7:26 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows [redacted] Mike Foster [redacted]
Subject: RE: Technical Report W31

Please find attached Report W31.
Basically continuing releases to maintain 1600 cumecs total flow in the mid Brisbane but watching predicted rainfall as the strategy may change. Fernvale and Mt Crosby bridges still should be unaffected but does depend on what rain we get today or tomorrow.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Saturday, 8 January 2011 7:46 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W31

Attached report number W31.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W34	Date of TSR release	9.1.2011	Time of TSR release	9.00pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue current releases however event is increasing in magnitude and will require increased releases.	
Strategy	• Continue the current releases until tomorrow noon when re4leases will be increased to impact Mt Crosby and Fernvale Bridges.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows may approach 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Very heavy rainfall has been recorded in the upper reaches of the Brisbane and Stanley in the last 6 hours with totals up 100 to 140mm. Totals for the last 24 hours range from 100 to 300mm.

Rainfall of similar magnitudes is expected in the 12 to 24 hours, especially around the Bremer/Warrill catchments as the system tracks south.

A severe weather warning remains current for heavy rainfall in the dam catchment areas.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 101.68 m AHD (about 500,000ML currently in storage) and rising quickly. Peak inflow to the dam is estimated to be about 4,000 m3/s based on observed rainfall and could be as high as 5,000m3/s with additional forecast rainfall. Five sluice gates are open releasing about 1,100m3/s (95,000Ml/d) into Wivenhoe Dam. At this stage the dam will reach at least 103.5 early Tuesday morning which will adversely impact areas around Kilcoy.

Since the commencement of the event on 02/01/2011approximately 100,000ML has been released from the dam into Wivenhoe, with an event total of the order of 520,000ML expected. This may increase due to the forecast rain in the next 24 to 48 hours. At this stage, releases will continue until at least Thursday.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

River levels upstream of the dam are rising quickly with significant inflow being generated from the intense heavy rainfall. Flows in the Brisbane River at Gregor's Ck have already reached 6,700m3/s and the river is still rising.

The dam level is rising again, with the current level being 69.10m AHD (1,410,000ML with about 300,00 of flood storage). Estimated peak inflow to the dam just from the Upper Brisbane R alone may reach as high as 7,500m3/s and, at this stage, the dam will reach at least 73.0 m AHD during Tuesday morning. Given the rapid increase in inflow volumes, it will be necessary to increase the release from Wivenhoe Monday morning.

The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam and, at this stage, releases will be kept below 3,500m3/s and the combined flows is the lower Brisbane will be limited to 4,000m3/s. This is below the limit of urban damages in the City reaches.

The current release rate from Wivenhoe Dam is 1,400m3/s (120,000ML/day). Gate opening will start to be increased from noon Monday and the release is expected increase to at least 2,600m3/s during Tuesday morning.

Since the commencement of the event on 02/01/2011 approximately 220,000ML has been released from the dam, with an event total approaching 1,000,000ML without further rain and as much as 1,500,000ML with forecast rainfall of (both including Somerset outflow). At this stage, releases will continue until at least Sunday 16th January 2011.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Saturday 15 January in varying degrees.

Water levels in the lower Brisbane R will be impacted by the combined flows of Lockyer Ck, Bremer River, local runoff and releases from Wivenhoe Dam.

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the updated Wivenhoe operating strategy.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	10.1.2011	Time		or Event	Change in strategy

[redacted]

From: [redacted]
Sent: Sunday, 9 January 2011 10:28 PM
To: Dan Spiller; Barry Dennien
Cc: [redacted]
Subject: Amended - Media update: Wivenhoe Dam releases - 10 January 2011

Categories: T8

Hi Barry and Dan,

Please see below the amended Wivenhoe update for discussion early tomorrow.

Media update – 10 January 2011

Wivenhoe Dam releases

Significant rainfall received across the catchment has pushed Wivenhoe Dam's capacity to approximately 122%???. In order to relieve the dam's flood storage compartment, controlled releases will be increased today, utilising a strategy designed to minimise impacts downstream.

The following bridges are however, likely to be affected: Fernvale Bridge, Mt Crosby Weir Bridge, Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing.

Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: Dan Spiller
Sent: Sunday, 9 January 2011 11:01 PM
To: 'Rob Drury'
Subject: Mt Crosby

Categories: T8

Rob,

Got you message - thanks.

Can you please ensure that ICC is advised if the bridge is closed?

Dan

Litsupport Brisbane

From: Dan Spiller
Sent: Sunday, 9 January 2011 11:07 PM
To: stephen robertson [redacted] Ken Smith [redacted] Debbie Best [redacted] Martin.Peter [redacted]
Cc: 'Rob Drury'; [redacted] Damien Brown [redacted] bob.reilly [redacted]
Subject: Updated Wivenhoe Dam release strategy
Attachments: Technical Situation Report W34.docx

All,

Latest advice from the Flood Control Centre attached.

There has been 100 to 300mm of rainfall in the Wivenhoe and Somerset dam catchments over the past 24 hours. Rainfall of similar magnitudes is expected over the next 12 to 24 hours.

At this time, including forecast rainfall, total inflows will exceed 1,000,000 ML and may approach 1,500,000 ML - in the order of the 1974 flood volume.

To date, the primary objective for this event has been managing to prevent inundation of the Mt Crosby Weir and Fernvale Bridges.

With the forecast volumes, this primary objective is being changed to minimizing the risk of urban inundation. This involves larger releases now, minimizing the risk of even larger releases later (were the flood compartment to reach high levels).

Urban inundation in the City reaches generally commences at total river flows of about 3,500 cubic metres per second (dam releases plus Lockyer and Bremer). At this time, and depending upon overnight rainfall, the Flood Control Centre is proposing to increase releases from around 1,200 to 2,500 cubic metres per second from midday tomorrow. This provides an allowance for other flows.

The Mt Crosby Weir and Fernvale bridges will certainly be inundated - isolating or inconveniencing many Brisbane Valley residents. The timing will depend largely on local flows, with the river having recently increased to be about one foot below the deck. Seqwater is preparing the bridge to be inundated, and may need to close it tonight. However, other flows permitting, we will delay inundating the bridge until tomorrow night - providing notice for impacted residents.

Actions to date:

- Notified Councils (up to the CEO level at BCC)
- Notified Police (Assistant Commissioner)
- Increasing treated water storage and preparing treatment plants, should there again be increased turbidity levels or other operational issues.

A media advice is being prepared now, for review and issue by 7am. The advice will address the closure of the bridges, with the intent of providing as much notice as possible to impacted residents (if not already closed). Impacts on the City reaches will be addressed following further consultation with Council (with there being a 20+ hour transit time).

It is important to note that the dams are managing impacts by delaying and reducing releases. For comparison, peak flows into the dam are forecast to reach up to 7,500 cubic metres per second - excluding any downstream flows.

Please call me or [redacted] if you require any further information.

Regards,
Daniel Spiller

TECHNICAL SITUATION REPORT

TSR Number	W34	Date of TSR release	9.1.2011	Time of TSR release	9.00pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue current releases however event is increasing in magnitude and will require increased releases.	
Strategy	• Continue the current releases until tomorrow noon when re4leases will be increased to impact Mt Crosby and Fernvale Bridges.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows may approach 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Very heavy rainfall has been recorded in the upper reaches of the Brisbane and Stanley in the last 6 hours with totals up 100 to 140mm. Totals for the last 24 hours range from 100 to 300mm.

Rainfall of similar magnitudes is expected in the 12 to 24 hours, especially around the Bremer/Warrill catchments as the system tracks south.

A severe weather warning remains current for heavy rainfall in the dam catchment areas.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 101.68 m AHD (about 500,000ML currently in storage) and rising quickly. Peak inflow to the dam is estimated to be about 4,000 m3/s based on observed rainfall and could be as high as 5,000m3/s with additional forecast rainfall. Five sluice gates are open releasing about 1,100m3/s (95,000Ml/d) into Wivenhoe Dam. At this stage the dam will reach at least 103.5 early Tuesday morning which will adversely impact areas around Kilcoy.

Since the commencement of the event on 02/01/2011approximately 100,000ML has been released from the dam into Wivenhoe, with an event total of the order of 520,000ML expected. This may increase due to the forecast rain in the next 24 to 48 hours. At this stage, releases will continue until at least Thursday.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

River levels upstream of the dam are rising quickly with significant inflow being generated from the intense heavy rainfall. Flows in the Brisbane River at Gregor's Ck have already reached 6,700m3/s and the river is still rising.

The dam level is rising again, with the current level being 69.10m AHD (1,410,000ML with about 300,00 of flood storage). Estimated peak inflow to the dam just from the Upper Brisbane R alone may reach as high as 7,500m3/s and, at this stage, the dam will reach at least 73.0 m AHD during Tuesday morning. Given the rapid increase in inflow volumes, it will be necessary to increase the release from Wivenhoe Monday morning.

The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam and, at this stage, releases will be kept below 3,500m3/s and the combined flows is the lower Brisbane will be limited to 4,000m3/s. This is below the limit of urban damages in the City reaches.

The current release rate from Wivenhoe Dam is 1,400m3/s (120,000ML/day). Gate opening will start to be increased from noon Monday and the release is expected increase to at least 2,600m3/s during Tuesday morning.

Since the commencement of the event on 02/01/2011 approximately 220,000ML has been released from the dam, with an event total approaching 1,000,000ML without further rain and as much as 1,500,000ML with forecast rainfall of (both including Somerset outflow). At this stage, releases will continue until at least Sunday 16th January 2011.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Saturday 15 January in varying degrees.

Water levels in the lower Brisbane R will be impacted by the combined flows of Lockyer Ck, Bremer River, local runoff and releases from Wivenhoe Dam.

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the updated Wivenhoe operating strategy.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	10.1.2011	**Time**		**or Event**	Change in strategy

From: Dan Spiller [redacted]
Sent: Sunday, 9 January 2011 11:23 PM
To: 'ceo [redacted]
Cc: Barry Dennien; 'Debbie Best [redacted]
Subject: Wivenhoe Dam operations update

[redacted]

Further to our conversation, our latest advice is as follows.

There has been 100 to 300mm of rainfall in the Wivenhoe and Somerset dam catchments over the past 24 hours. Rainfall of similar magnitudes is expected over the next 12 to 24 hours. Total inflows will exceed 1,000,000 ML, based on rainfall to date.

To date, the primary objective for this event has been managing to prevent inundation of the Mt Crosby Weir and Fernvale Bridges.

With the forecast volumes, this primary objective is being changed to minimizing the risk of urban inundation. This involves larger releases now, minimizing the risk of even larger releases later (were the flood compartment to reach high levels).

Urban inundation in the City reaches generally commences at total river flows of about 3,500 cubic metres per second (dam releases plus Lockyer and Bremer). At this time, and depending upon overnight rainfall, the Flood Control Centre is proposing to increase releases from around 1,200 to 2,500 cubic metres per second from midday tomorrow. This provides an allowance for other flows.

The Mt Crosby Weir and Fernvale bridges will certainly be inundated - isolating or inconveniencing many Brisbane Valley residents. The timing will depend largely on local flows, with the river having recently increased to be about one foot below the deck. Seqwater is preparing the bridge to be inundated, and may need to close it tonight. However, other flows permitting, we will delay inundating the bridge until tomorrow night - providing notice for impacted residents.

We propose to issue a media advice about the increases and potential impact on bridges early tomorrow morning (about 7am). A draft is below. I would appreciate any comments, but understand time is limited. We will finalize it before issue, based on the status of the Weir Bridge at that time. Obviously, it is irrelevant if other flows result in closure before releases are increased.

The advice does not address urban impacts at this time. We would prefer to review the situation in the morning and consult with Councils before finalising the strategy. This includes reviewing where the rainfall occurs.

As you know, the dams are managing impacts by delaying and reducing releases. For comparison, peak flows into the dam are forecast to reach up to 7,500 cubic metres per second - excluding any downstream flows.

I will speak to you tomorrow. In the meantime, please call me on [redacted] if you require any further information.

Regards,
Daniel Spiller

Media update – 10 January 2011

Wivenhoe Dam releases

Significant rainfall received across the catchment has pushed Wivenhoe Dam's capacity to approximately _%. In order to relieve the dam's flood storage compartment, controlled releases will be increased today, utilising a strategy designed to minimise impacts downstream.

Increased releases, combined with other flows, are expected to result in the closure of the Fernvale Bridge and Mt Crosby Weir Bridge. This could occur this morning, but will be delayed until tonight if possible.

A number of other bridges have already been impacted, including Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing.

Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

ENDS

[redacted]

From: Dan Spiller
Sent: Sunday, 9 January 2011 11:26 PM
To: [redacted]
Cc: Barry Dennien; Debbie Best [redacted]

Subject: Draft release

Categories: T8

[redacted]

As discussed, draft release below.

We will finalise for issue by 7am, subject to the Weir not being inundated already at that time.

Dan

Media update – 10 January 2011

Wivenhoe Dam releases

Significant rainfall received across the catchment has pushed Wivenhoe Dam's capacity to approximately _%. In order to relieve the dam's flood storage compartment, controlled releases will be increased today, utilising a strategy designed to minimise impacts downstream.

Increased releases, combined with other flows, are expected to result in the closure of the Fernvale Bridge and Mt Crosby Weir Bridge. This could occur this morning, but will be delayed until tonight if possible.

A number of other bridges have already been impacted, including Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing.

Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

ENDS

[redacted]

From: Colin Jensen [redacted]
Sent: Monday, 10 January 2011 12:15 AM
To: Dan Spiller
Cc: Chris Lavin; [redacted]
Subject: Re: Wivenhoe Dam operations update

Categories: T8

Thanks Dan

CC Chris and Michael - for your consideration

The BMTMC has advised that about ten minutes ago, the Mt Crosby Weir has now closed. Not sure how this equates - must be stream flows are greater than otherwise being figured on. Accordingly, the media release should be further worked on in the morning.

Thanks

Colin Jensen
Chief Executive Officer
Brisbane City Council
GPO Box 1434 | Brisbane Qld 4001
[redacted]ane, Qld 4000

[redacted]

>>> Dan Spiller [redacted] 09/01/11 11:22 PM >>>
Colin,

Further to our conversation, our latest advice is as follows.

There has been 100 to 300mm of rainfall in the Wivenhoe and Somerset dam catchments over the past 24 hours. Rainfall of similar magnitudes is expected over the next 12 to 24 hours. Total inflows will exceed 1,000,000 ML, based on rainfall to date.

To date, the primary objective for this event has been managing to prevent inundation of the Mt Crosby Weir and Fernvale Bridges.

With the forecast volumes, this primary objective is being changed to minimizing the risk of urban inundation. This involves larger releases now, minimizing the risk of even larger releases later (were the flood compartment to reach high levels).

Urban inundation in the City reaches generally commences at total river flows of about 3,500 cubic metres per second (dam releases plus Lockyer and Bremer). At this time, and depending upon overnight rainfall, the Flood Control Centre is proposing to increase releases from around 1,200 to 2,500 cubic metres per second from midday tomorrow. This provides an allowance for other flows.

The Mt Crosby Weir and Fernvale bridges will certainly be inundated - isolating or inconveniencing many Brisbane Valley residents. The timing will depend largely on local flows, with the river having recently increased to be about one foot below the deck. Seqwater is preparing the bridge to be inundated, and may need to close it tonight. However, other flows permitting, we will delay inundating the bridge until tomorrow night - providing notice for impacted residents.

We propose to issue a media advice about the increases and potential impact on bridges early tomorrow morning (about 7am). A draft is below. I would appreciate any comments, but understand time is limited. We will finalize it before issue, based on the status of the Weir Bridge at that time. Obviously, it is irrelevant if other flows result in closure before releases are increased.

The advice does not address urban impacts at this time. We would prefer to review the situation in the morning and consult with Councils before finalising the strategy. This includes reviewing where the rainfall occurs.

As you know, the dams are managing impacts by delaying and reducing releases. For comparison, peak flows into the dam are forecast to reach up to 7,500 cubic metres per second - excluding any downstream flows.

I will speak to you tomorrow. In the meantime, please call me on 0403 607 857 if you require any further information.

Regards,
Daniel Spiller

Media update - 10 January 2011
Wivenhoe Dam releases
Significant rainfall received across the catchment has pushed Wivenhoe Dam's capacity to approximately _%. In order to relieve the dam's flood storage compartment, controlled releases will be increased today, utilising a strategy designed to minimise impacts downstream.

Increased releases, combined with other flows, are expected to result in the closure of the Fernvale ridge and Mt Crosby Weir Bridge. This could occur this morning, but will be delayed until tonight if possible.

A number of other bridges have already been impacted, including Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing.

Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

ENDS

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

****
This message has passed through an insecure network.
Please direct all enquiries to the message author.
****

****
This message has passed through an insecure network.
Please direct all enquiries to the message author.
****

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 1:28 AM
To: Dan Spiller; Barry Dennien; [redacted] SEQWGM Media; debbie.bes[redacted] [redacted] Peter Borrows; Peter.Allen[redacted]
Subject: Re: Technical Report W34

Since earlier discussions, further rain and local flooding have closed Mt Crosby and Fernvale bridges. Releases will now be ramped up overnight rather than tomorrow since these bridges are now closed and due to increasing inflows. Councils have been notified and are on site. Media messages in morning need to be adjusted accordingly. Rob

---

From: Dan Spiller [redacted]
To: Rob Drury; Barry Dennien [redacted]
SEQWGM Media [redacted] Debbie Best [redacted]
Sent: Sun Jan 09 21:27:23 2011
Subject: FW: Technical Report W34

Technical report below.

Teleconference at 9.30.

Details are:

Phone: [redacted]
PIN: [redacted]

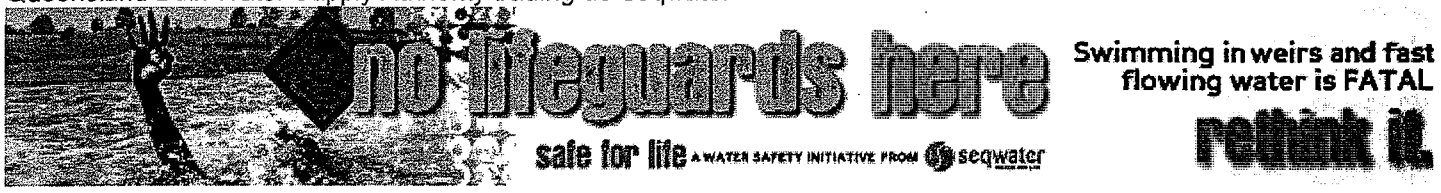
Regards,
Dan

From: Rob Drury [redacted]
Sent: Sunday, January 09, 2011 9:18 PM
To: Rob Drury; Dan Spiller
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W34

See attached report W34.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



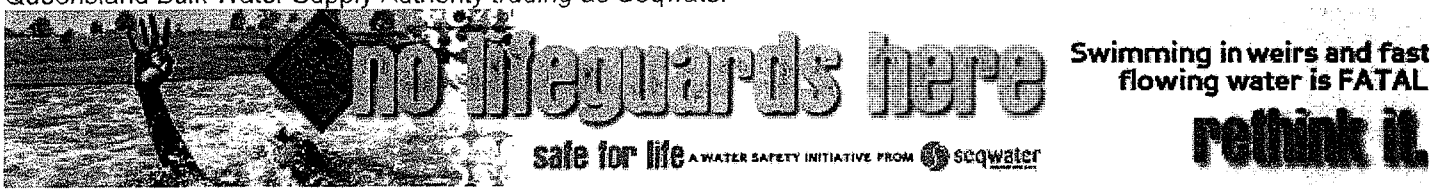
[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Sunday, 9 January 2011 7:26 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W31

Please find attached Report W31.
Basically continuing releases to maintain 1600 cumecs total flow in the mid Brisbane but watching predicted rainfall as the strategy may change. Fernvale and Mt Crosby bridges still should be unaffected but does depend on what rain we get today or tomorrow.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Saturday, 8 January 2011 7:46 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W31

Attached report number W31.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Litsupport Brisbane

From: Dan Spiller
Sent: Monday, 10 January 2011 5:31 AM
To: Dan Spiller; 'stephen.robertson [redacted] 'Ken Smith [redacted]
'Debbie Best [redacted] 'Martin.Peter [redacted]
'Dunn.Kerry [redacted]
Cc: 'Rob Drury'; [redacted] 'Damien Brown [redacted]
[redacted] 'bob.reilly [redacted]
Subject: RE: Updated Wivenhoe Dam release strategy

The Mt Crosby Weir and Fernvale Bridges were both inundated by other flows last night. Councils were advised and are on site.

Dam releases began to be increased overnight, brought forward because the bridges were already and with increasing inflows to storages.

We are preparing communications and technical information.

Regards,
Dan

From: Dan Spiller
Sent: Sunday, January 09, 2011 11:07 PM
To: stephen.robertson [redacted] Ken Smith [redacted]
[redacted] Debbie Best [redacted]
Martin.Peter [redacted]
Cc: 'Rob Drury'; [redacted]
[redacted] Damien Brown [redacted] bob.reilly [redacted]
Subject: Updated Wivenhoe Dam release strategy

All,

latest advice from the Flood Control Centre attached.

There has been 100 to 300mm of rainfall in the Wivenhoe and Somerset dam catchments over the past 24 hours. Rainfall of similar magnitudes is expected over the next 12 to 24 hours.

At this time, including forecast rainfall, total inflows will exceed 1,000,000 ML and may approach 1,500,000 ML - in the order of the 1974 flood volume.

To date, the primary objective for this event has been managing to prevent inundation of the Mt Crosby Weir and Fernvale Bridges.

With the forecast volumes, this primary objective is being changed to minimizing the risk of urban inundation. This involves larger releases now, minimizing the risk of even larger releases later (were the flood compartment to reach high levels).

Urban inundation in the City reaches generally commences at total river flows of about 3,500 cubic metres per second (dam releases plus Lockyer and Bremer). At this time, and depending upon overnight rainfall, the Flood Control Centre is proposing to increase releases from around 1,200 to 2,500 cubic metres per second from midday tomorrow. This provides an allowance for other flows.

The Mt Crosby Weir and Fernvale bridges will certainly be inundated - isolating or inconveniencing many Brisbane Valley residents. The timing will depend largely on local flows, with the river having recently increased to be about one foot below the deck. Seqwater is preparing the bridge to be inundated, and may need to close it tonight. However, other flows permitting, we will delay inundating the bridge until tomorrow night - providing notice for impacted residents.

Actions to date:

- Notified Councils (up to the CEO level at BCC)
- Notified Police (Assistant Commissioner)
- Increasing treated water storage and preparing treatment plants, should there again be increased turbidity levels or other operational issues.

A media advice is being prepared now, for review and issue by 7am. The advice will address the closure of the bridges, with the intent of providing as much notice as possible to impacted residents (if not already closed). Impacts on the City reaches will be addressed following further consultation with Council (with there being a 20+ hour transit time).

It is important to note that the dams are managing impacts by delaying and reducing releases. For comparison, peak flows into the dam are forecast to reach up to 7,500 cubic metres per second - excluding any downstream flows.

Please call me on [redacted] if you require any further information.

Regards,
Daniel Spiller

Litsupport Brisbane

From: Dan Spiller
Sent: Monday, 10 January 2011 5:55 AM
To: Rob Drury
Subject: Re: Technical Report W34

Thanks Rob.

We will need more details soon for media and stakeholders. I will be in the office in 5 minutes.

Dan

On 10/01/2011, at 1:27 AM, "Rob Drury" [redacted] wrote:

> Since earlier discussions, further rain and local flooding have closed Mt Crosby and Fernvale bridges. Releases will now be ramped up overnight rather than tomorrow since these bridges are now closed and due to increasing inflows. Councils have been notified and are on site. Media messages in morning need to be adjusted accordingly. Rob
>
> ---
>
> **From:** Dan Spiller [redacted]
> **To:** Rob Drury; Barry Dennien [redacted] Debbie Best [redacted] debbie.best [redacted]
> **Sent:** Sun Jan 09 21:27:23 2011
> **Subject:** FW: Technical Report W34
>
> Technical report below.
>
> Teleconference at 9.30.
>
> Details are:
>
> Phone: [redacted]
>
> PIN: [redacted]
>
> Regards,
>
> Dan

From: Rob Drury [redacted]
Sent: Sunday, January 09, 2011 9:18 PM
To: Rob Drury; Dan Spiller
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W34

See attached report W34.

Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.jpg>

<image002.png>

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

From: Rob Drury
Sent: Sunday, 9 January 2011 7:26 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows; [redacted] Mike Foster; [redacted]
Subject: RE: Technical Report W31

Please find attached Report W31.

Basically continuing releases to maintain 1600 cumecs total flow in the mid Brisbane but watching predicted rainfall as the strategy may change. Fernvale and Mt Crosby bridges still should be unaffected but does depend on what rain we get today or tomorrow.

Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.jpg>

<image002.png>

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

From: Rob Drury
Sent: Saturday, 8 January 2011 7:46 AM
To: Rob Drury; 'Dan Spiller'
Cc: Peter Borrows [redacted] Mike Foster [redacted]
Subject: RE: Technical Report W31

Attached report number W31.

Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.jpg>

<image002.png>

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Dan Spiller

From: Dan Spiller
Sent: Monday, 10 January 2011 5:59 AM
To: Colin Jensen
Cc: Chris Lavin [redacted]
Subject: Re: Wivenhoe Dam operations update

Colin,

You are right. Both bridges closed soon after my email, river levels having risen quickly.

With bridges inundated, releases started to be increased slowly last night.

We will call with more details later.

Dan

On 10/01/2011, at 12:15 AM, "Colin Jensen" [redacted]

> Thanks Dan
>
> CC Chris and [redacted] - for your consideration
>
> The BMTMC has advised that about ten minutes ago, the Mt Crosby Weir has now closed. Not sure how this equates - must be stream flows are greater than otherwise being figured on. Accordingly, the media release should be further worked on in the morning.
>
> Thanks
>
> Colin Jensen
> Chief Executive Officer
> Brisbane City Council
> GPO Box 1434 | Brisbane Qld 4001
> Level 23, Brisbane Square | 266 George Street, Brisbane, Qld 4000
> Phone: [redacted]
> Email: [redacted]
>>> Dan Spiller [redacted] 09/01/11 11:22 PM >>>
> Colin,
>
> Further to our conversation, our latest advice is as follows.
>
> There has been 100 to 300mm of rainfall in the Wivenhoe and Somerset dam catchments over the past 24 hours. Rainfall of similar magnitudes is expected over the next 12 to 24 hours. Total inflows will exceed 1,000,000 ML, based on rainfall to date.
>
> To date, the primary objective for this event has been managing to prevent inundation of the Mt Crosby Weir and Fernvale Bridges.
>
> With the forecast volumes, this primary objective is being changed to minimizing the risk of urban inundation. This involves larger releases now, minimizing the risk of even larger releases later (were the flood compartment to reach high levels).
>
> Urban inundation in the City reaches generally commences at total river flows of about 3,500 cubic metres per second (dam releases plus Lockyer and Bremer). At this time, and depending upon overnight rainfall, the Flood Control Centre is proposing to increase

releases from around 1,200 to 2,500 cubic metres per second from midday tomorrow. This provides an allowance for other flows.
>
> The Mt Crosby Weir and Fernvale bridges will certainly be inundated - isolating or inconveniencing many Brisbane Valley residents. The timing will depend largely on local flows, with the river having recently increased to be about one foot below the deck. Seqwater is preparing the bridge to be inundated, and may need to close it tonight. However, other flows permitting, we will delay inundating the bridge until tomorrow night - providing notice for impacted residents.
>
> We propose to issue a media advice about the increases and potential impact on bridges early tomorrow morning (about 7am). A draft is below. I would appreciate any comments, but understand time is limited. We will finalize it before issue, based on the status of the Weir Bridge at that time. Obviously, it is irrelevant if other flows result in closure before releases are increased.
>
> The advice does not address urban impacts at this time. We would prefer to review the situation in the morning and consult with Councils before finalising the strategy. This includes reviewing where the rainfall occurs.
>
> As you know, the dams are managing impacts by delaying and reducing releases. For comparison, peak flows into the dam are forecast to reach up to 7,500 cubic metres per second - excluding any downstream flows.
>
> I will speak to you tomorrow. In the meantime, please call me on [redacted] if you require any further information.
>
> Regards,
> Daniel Spiller
>
>
> Media update - 10 January 2011
> Wivenhoe Dam releases
> Significant rainfall received across the catchment has pushed Wivenhoe Dam's capacity to approximately _%. In order to relieve the dam's flood storage compartment, controlled releases will be increased today, utilising a strategy designed to minimise impacts downstream.
>
> Increased releases, combined with other flows, are expected to result in the closure of the Fernvale Bridge and Mt Crosby Weir Bridge. This could occur this morning, but will be delayed until tonight if possible.
>
> A number of other bridges have already been impacted, including Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing.
>
> Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.
>
> Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.
>
>
> ENDS
>
> _____
> This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

> If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
> While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
>
> **********
> This message has passed through an insecure network.
> Please direct all enquiries to the message author.
> **********
>
>
> **********
> This message has passed through an insecure network.
> Please direct all enquiries to the message author.
> **********

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 6:20 AM
To: [redacted]; Dan Spiller; Barry Dennien
Subject: RE: FOC Situation Report at 01:00 hrs on Monday 10 January 2011

As per the report, without further rain it may be 1,500,000ML released during the event which is about what 1974 flow was. But it was uncontrolled.

Depending on what happens downstream there may be impacts but we should stress the significant reduction in peak flows as per the report below, depending on what release rate we end up with.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: [redacted]
Sent: Monday, 10 January 2011 6:16 AM
To: Rob Drury; 'Dan Spiller'; 'Barry Dennien'
Cc: Peter Borrows [redacted]
Subject: RE: FOC Situation Report at 01:00 hrs on Monday 10 January 2011

Thanks Rob,

Woking on update now

Cheers

[redacted]

From: Rob Drury
Sent: Monday, 10 January 2011 06:14
To: 'Dan Spiller'; 'Barry Dennien'
Cc: [redacted] Peter Borrows; [redacted]
Subject: FW: FOC Situation Report at 01:00 hrs on Monday 10 January 2011

See below FOC report as at 1am.
Will send a technical report in hour or so when I get an update off the FOC.

As at 6am this morning the levels are
Wivenhoe now 70.77m and 140.9% holding 1,641,685ML or 480,000Ml above FSL.
Somerset 150.9% and holding 573,067ML or 193,000ML above FSL.

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Duty Engineer [mailto:dutyseq@uqconnect.net]
Sent: Monday, 10 January 2011 1:14 AM
To: [redacted] flood.qld@[redacted]; Mike Foster [redacted] Peter Allen; Rob Drury; [redacted]; Bill Stephens; [redacted] John.Ruffini [redacted] John Tibaldi; Rob.ayre [redacted] Terry [redacted] Brett Schultz [redacted] Graham Keegan; [redacted]
Cc: [redacted] Mailbox; Chris Lavin; [redacted] James Charalambous; Ken Morris; Robert McGlinn; Santina Pennisi; Tony Trace
Subject: FOC Situation Report at 01:00 hrs on Monday 10 January 2011

Rainfall

Very heavy rainfall has been recorded in the Upper Brisbane and Stanley Rivers in the last 12 hours with totals up 100 to 240mm. Totals for the last 24 hours range from 100 to 300mm.

Rainfall of similar magnitudes is expected in the 12 to 24 hours around the downstream catchments as the system tracks south.

A severe weather warning remains current for heavy rainfall in the dam catchment areas.

North Pine Dam (Full Supply Level 39.60 m AHD)

The dam level was 39.95 m and steady. Five gates are open releasing 445 m3/s. The inflow into the dam since the commencement of the event is 42,000 ML. Estimated event volume is 57,000 ML assuming no further rainfall. Gate operations will continue until at least Tuesday 11 January 2011.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 102.22 m AHD and rising quickly (storing 157,000 ML above FSL). Peak inflow to the dam is estimated to be about 4,200 m3/s based on observed rainfall and could be as high as 5,000m3/s with additional forecast rainfall. Five sluice gates are open releasing about 1,100m3/s (95,000Ml/d) into Wivenhoe Dam. At this stage the dam will reach at least 103.5 on Monday afternoon which will adversely impact areas around Kilcoy.

Since the commencement of the event on 02/01/2011approximately 115,000ML has been released from the dam into Wivenhoe, with an event total of the order of 520,000ML expected. This is expected to increase due to the forecast rain in the next 24 to 48 hours. At this stage, releases will continue until at least Thursday.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

River levels upstream of the dam are rising quickly with significant inflow being generated from the intense heavy rainfall. Flows in the Brisbane River at Gregor's Ck have already reached 7,350m3/s and the river has just peaked at 23:00 on Sunday 9 January.

The dam level is rising quickly, with the current level being 69.60m AHD (storing 301,000 ML). Estimated peak inflow to the dam just from the Upper Brisbane R alone may reach as high as 8,800m3/s and, at this stage, the dam will reach at least 73.3 m AHD during Tuesday morning. Given the rapid increase in inflow volumes, it will be necessary to increase the release from Wivenhoe during Monday morning.

The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam and, at this stage, releases will be kept below 3,500m3/s and the combined flows in the lower Brisbane will be limited to 4,000m3/s if possible.

Fernvale Bridge approaches and Mt Crosby Weir Bridge have been inundated and both bridges are now closed or are in the process of being closed.

The current release rate from Wivenhoe Dam is 1,400m3/s (120,000ML/day). Gate opening will start to be increased during early Monday morning and the release is expected to increase to at least 2,600m3/s.

Since the commencement of the event on 02/01/2011 approximately 240,000ML has been released from the dam, with an event total approaching 1,500,000ML without further rain and as much as 2,100,000ML with forecast rainfall of (both including Somerset outflow). At this stage, releases will continue until at least Sunday 16th January 2011.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Saturday 15 January in varying degrees.

Water levels in the lower Brisbane R will be impacted by the combined flows of Lockyer Ck, Bremer River, local runoff and releases from Wivenhoe Dam. If the predicted rainfall eventuates in the downstream tributary catchments the resultant combined flows in the lower Brisbane may exceed the threshold of damaging discharge in the urban areas within the next 24 to 48 hours.

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the updated Wivenhoe operating strategy.

Regards

John Ruffini

Duty Engineer
Flood Operations Centre

[redacted]

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 6:29 AM
To: [redacted]; Dan Spiller
Subject: RE: FOC Situation Report at 01:00 hrs on Monday 10 January 2011

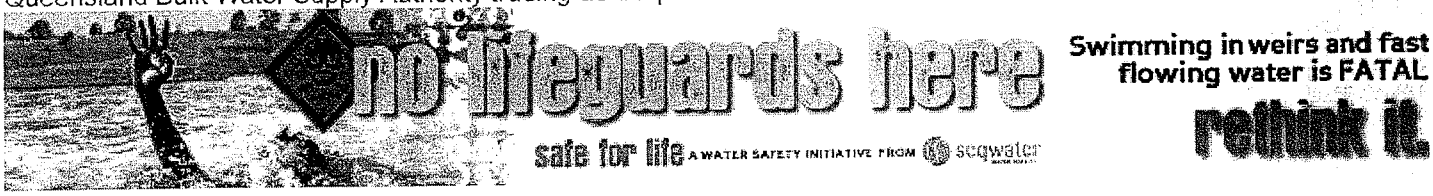
[redacted]

Dan and Barry from WGM are doing some media stuff this morning.
We had a teleconference last night with DERM and WGM to discuss.

It would be good if you could get onto the PR group of WGM, Councils and us to see if we can get a consolidated response via Dan or WGM I guess.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: [redacted]
Sent: Monday, 10 January 2011 6:22 AM
To: Rob Drury
Subject: RE: FOC Situation Report at 01:00 hrs on Monday 10 January 2011

Will we have an update on Leslie Harrison?

From: Rob Drury
Sent: Monday, 10 January 2011 06:20
To: [redacted]Dan Spiller'; 'Barry Dennien'
Subject: RE: FOC Situation Report at 01:00 hrs on Monday 10 January 2011

As per the report, without further rain it may be 1,500,000ML released during the event which is about what 1974 flow was. But it was uncontrolled.

Depending on what happens downstream there may be impacts but we should stress the significant reduction in peak flows as per the report below, depending on what release rate we end up with.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From [redacted]
Sent: Monday, 10 January 2011 6:16 AM
To: Rob Drury; 'Dan Spiller'; 'Barry Dennien'
Cc: Peter Borrows; [redacted]
Subject: RE: FOC Situation Report at 01:00 hrs on Monday 10 January 2011

Thanks Rob,

Woking on update now

Cheers

Paul

From: Rob Drury
Sent: Monday, 10 January 2011 06:14
To: 'Dan Spiller'; 'Barry Dennien'
Cc: [redacted] Peter Borrows; David Roberts
Subject: FW: FOC Situation Report at 01:00 hrs on Monday 10 January 2011

See below FOC report as at 1am.
Will send a technical report in hour or so when I get an update off the FOC.

As at 6am this morning the levels are
Wivenhoe now 70.77m and 140.9% holding 1,641,685ML or 480,000Ml above FSL.

Somerset 150.9% and holding 573,067ML or 193,000ML above FSL.

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Duty Engineer [mailt[redacted]
Sent: Monday, 10 January 2011 1:14 AM
To: [redacted] flood.qld@bom.gov.au; Mike Foster; [redacted] Peter Allen; Rob Drury; [redacted] John.Ruffini [redacted] John Tibaldi; Rob.ayre [redacted] Terry Malone; Brett Schultz; [redacted]
Cc: [redacted] Mailbox; Chris Lavin; [redacted] Don Carroll; [redacted] James Charalambous; Ken Morris; [redacted] Santina Pennisi; Tony Trace
Subject: FOC Situation Report at 01:00 hrs on Monday 10 January 2011

Rainfall

Very heavy rainfall has been recorded in the Upper Brisbane and Stanley Rivers in the last 12 hours with totals up 100 to 240mm. Totals for the last 24 hours range from 100 to 300mm.

Rainfall of similar magnitudes is expected in the 12 to 24 hours around the downstream catchments as the system tracks south.

A severe weather warning remains current for heavy rainfall in the dam catchment areas.

North Pine Dam (Full Supply Level 39.60 m AHD)

The dam level was 39.95 m and steady. Five gates are open releasing 445 m3/s. The inflow into the dam since the commencement of the event is 42,000 ML. Estimated event volume is 57,000 ML assuming no further rainfall. Gate operations will continue until at least Tuesday 11 January 2011.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 102.22 m AHD and rising quickly (storing 157,000 ML above FSL). Peak inflow to the dam is estimated to be about 4,200 m3/s based on observed rainfall and could be as high as 5,000m3/s with additional forecast rainfall. Five sluice gates are open releasing about 1,100m3/s (95,000Ml/d) into Wivenhoe Dam. At this stage the dam will reach at least 103.5 on Monday afternoon which will adversely impact areas around Kilcoy.

Since the commencement of the event on 02/01/2011approximately 115,000ML has been released from the dam into Wivenhoe, with an event total of the order of 520,000ML expected. This is expected to increase due to the forecast rain in the next 24 to 48 hours. At this stage, releases will continue until at least Thursday.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

River levels upstream of the dam are rising quickly with significant inflow being generated from the intense heavy rainfall. Flows in the Brisbane River at Gregor's Ck have already reached 7,350m3/s and the river has just peaked at 23:00 on Sunday 9 January.

The dam level is rising quickly, with the current level being 69.60m AHD (storing 301,000 ML). Estimated peak inflow to the dam just from the Upper Brisbane R alone may reach as high as 8,800m3/s and, at this stage, the dam will reach at least 73.3 m AHD during Tuesday morning. Given the rapid increase in inflow volumes, it will be necessary to increase the release from Wivenhoe during Monday morning.

The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam and, at this stage, releases will be kept below 3,500m3/s and the combined flows in the lower Brisbane will be limited to 4,000m3/s if possible.

Fernvale Bridge approaches and Mt Crosby Weir Bridge have been inundated and both bridges are now closed or are in the process of being closed.

The current release rate from Wivenhoe Dam is 1,400m3/s (120,000ML/day). Gate opening will start to be increased during early Monday morning and the release is expected to increase to at least 2,600m3/s.

Since the commencement of the event on 02/01/2011 approximately 240,000ML has been released from the dam, with an event total approaching 1,500,000ML without further rain and as much as 2,100,000ML with forecast rainfall of (both including Somerset outflow). At this stage, releases will continue until at least Sunday 16th January 2011.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Saturday 15 January in varying degrees.

Water levels in the lower Brisbane R will be impacted by the combined flows of Lockyer Ck, Bremer River, local runoff and releases from Wivenhoe Dam. If the predicted rainfall eventuates in the downstream tributary catchments the resultant combined flows in the lower Brisbane may exceed the threshold of damaging discharge in the urban areas within the next 24 to 48 hours.

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the updated Wivenhoe operating strategy.

Regards

John Ruffini

Duty Engineer
Flood Operations Centre

[redacted]

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to

this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 6:36 AM
To: [redacted] Dan Spiller

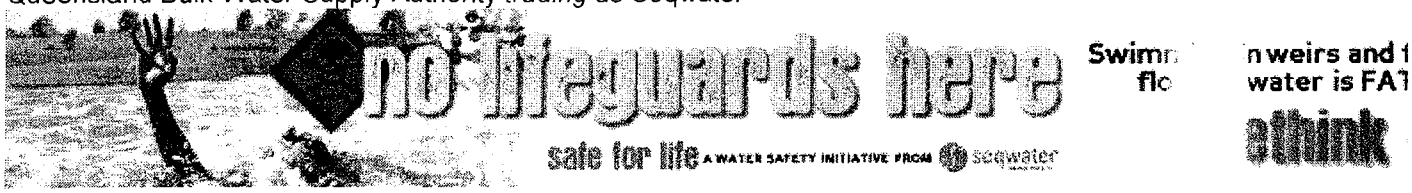
Categories: T8

Two things

- Current release rate is 1,753m3/s (150,000ML/day) but ramping up
- Our Flood Centre has been keeping BCC flood centre informed which BCC mobilised. The o[redacted]ssue so far is that our manual has the threshold of damage to urban areas as around 4,000cumecs in th[redacted]er Brisbane River, they advised they think it is more like 3,500cumecs. We are aiming for the 4,000cu[redacted]as per the approved manual so It would be good if we could still get a consolidated message out thro[redacted]all parties. Maybe advising flows of 3,500 to 4,000 cumecs which may cause some minor impacts down[redacted]eam, of course this also depends on further rainfall in local areas. Of course if we need to go highe[redacted]n the message would change.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
O Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the ad[redacted]ee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confiden[redacted]lity attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you[redacted]received this email in error please contact the sender immediately and delete the material from your[redacted]l system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: [redacted]
Sent: Monday, 10 January 2011 6:51 AM
To: Dan Spiller

Categories: T8

Media update – 10 January 2011

Wivenhoe Dam releases

Significant rainfall received across catchments has lifted Wivenhoe Dam's level to above 140 per cent and Somerset Dam to above 150 per cent. Although releases are being made, significant quantities of water have been held back to manage impacts downstream and allow for inflows which have occurred below Wivenhoe Dam.

Overnight, this weather has inundated Fernvale Bridge and Mt Crosby Weir bridge together with a number of local roads. They join a number of other bridges already impacted, including Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing.

In order to relieve the dam's flood storage compartment and with more rain forecast, controlled releases are being increased today. This will be done in consultation with the Bureau of Meteorology and local councils, utilising a strategy to limit impacts downstream.

Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

[redacted]

From: [redacted]
Sent: Monday, 10 January 2011 6:53 AM
To: Dan Spiller; Barry Dennien
Subject: slight amendment - media update

Categories: T8

Media update – 10 January 2011

Wivenhoe Dam releases

Significant rainfall received across catchments has lifted Wivenhoe Dam's level to above 140 per cent and Somerset Dam to above 150 per cent. Although releases are being made, significant quantities of water have been held back to manage impacts downstream and allow for inflows which have occurred below Wivenhoe Dam.

Overnight, this weather has inundated Fernvale Bridge and Mt Crosby Weir bridge together with a number of local roads. They join a number of other bridges already impacted, including Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing.

In order to relieve the dam's flood storage compartment and with more rain forecast, controlled releases are being increased today. This will be done in consultation with the Bureau of Meteorology and local councils, utilising a strategy to limit impacts where possible downstream, noting that these releases are a necessity.

Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

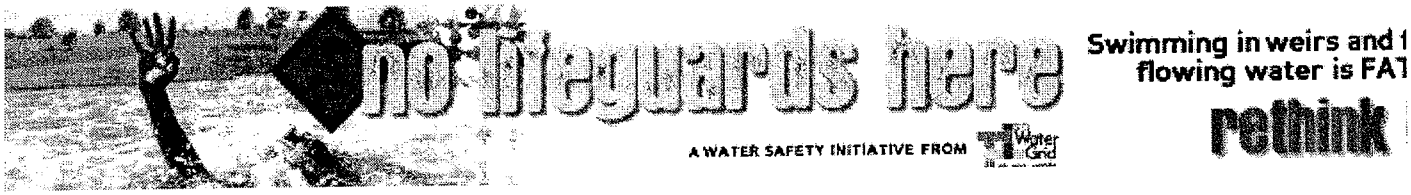
About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager

[redacted]

Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

[redacted]

From: [redacted]
Sent: Monday, 10 January 2011 6:56 AM
To: SEQWGM Media; [redacted]; Barry Dennien; Dan Spiller; Mike Foster; [redacted]
Cc: [redacted] Mike Foster; Reception; [redacted]
Subject: Water Release Update

Categories: T8

As at 7.00 AM on Monday 10 January, the following applies:

SOMERSET DAM:
As a result of rainfall and inflows, water is being released into Wivenhoe through five sluice gates at about 95,000 megalitres per day and is likely to continue until Thursday 13 January. Areas around Kilcoy are likely to be impacted as a result of the rising dam levels.

WIVENHOE DAM:
Upstream levels are rising quickly as a result of significant heavy rainfall. The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam.

Gate Releases of around 150,000 megalitres a day are underway and are likely to be increased to about 223,00 megalitres per day by late Monday 10 January.

Local Councils have been advised that as a result of Lockyer Creek flows, local runoff and Wivenhoe releases, Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge Colleges Crossing, Fernvale Bridge, and Mt Crosby Weir Bridge may be inundated for several days.

NORTH PINE DAM:
Five gates are open, releasing around 41,000 megalitres a day and will continue until at least Tuesday 11 January.

The local Council is being kept informed regarding Youngs Crossing.

LESLIE HARRISON DAM:

Gate releases are underway due to rainfall and inflows.

HINZE DAM:
A minor release of around 1200 megaltires a day is being made through the emergency gates. There is no public access to the spillway.

For detailed information on road crossing closures and other potential impacts, always contact your local council.

RECREATION UPDATE:

Lake Wivenhoe
Lake Wivenhoe is currently closed to water based recreation activities, and is expected to remain closed for some days, due to the high water levels.

Lake Somerset
Lake Somerset is closed to water based recreation activities due to the high water levels and is expected to remain closed into next week, depending upon the conditions.

The following recreation sites are currently closed due to submerged infrastructure, or dangerous conditions –

- O'Sheas Crossing
- Hamon Cove
- Logan Inlet
- Captain Logan Camp
- River access at Atkinson's Crossing
- Billies Bay/Hays Landing
- The Spit
- Lake Somerset Holiday Park Kirkleagh [Boat ramps only]

Other recreation areas at Lake Wivenhoe are open for land based recreation activities.
The Spillway Lookout recreation area is open; however visitors are advised that there may be long delays due to the numbers of people on site. Security staff and traffic controllers will be on site to assist with visitor management – all visitors must comply with the reasonable directions of security staff and traffic controllers.

Lake Borumba
Yabba Creek Road between Imbil and Borumba Dam is currently closed; meaning that access to the lake is not available and be closed for several days.

Lake Baroon
Lake Baroon has been closed to on-water recreation activities due to the current lake level. The recreation areas at Lake Baroon are open for land based activities.

Lake Maroon
Lake Maroon remains closed to water skiing and swimming but is open to boating and fishing.

Care should be taken at the recreation sites that are open, with the ground being totally saturated. Vehicles must be parked only in designated parking areas, and should not be driven onto grassed areas.

This information will be updated during the afternoon of Monday 10 January.

[redacted]
Senior Communications Advisor
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au



Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received

this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Dan Spiller
Sent: Monday, 10 January 2011 6:59 AM
To: [redacted]
Cc: Barry Dennien
Subject: FW: slight amendment - media update
Attachments: image001.gif

Categories: T8

[redacted]

As discussed, proposed media release below. We intend to issue this within the next 15 minutes, provided that you have not major concerns.

We are speaking to your media team directly also.

We will provide more technical advice soon.

Regards,
Dan

Media update – 10 January 2011

Wivenhoe Dam releases

Significant rainfall received across catchments has lifted Wivenhoe Dam's level to above 140 per cent and Somerset Dam to above 150 per cent. Although releases are being made, significant quantities of water have been held back to manage impacts downstream and allow for inflows which have occurred below Wivenhoe Dam.

Overnight, this weather has inundated Fernvale Bridge and Mt Crosby Weir bridge together with a number of local roads. They join a number of other bridges already impacted, including Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing. These bridges are expected to be inundated until at least Sunday.

In order to relieve the dam's flood storage compartment and with more rain forecast, controlled releases are being increased today. This will be done in consultation with the Bureau of Meteorology and local councils, utilising a strategy to limit impacts where possible downstream, noting that these releases are a necessity.

Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

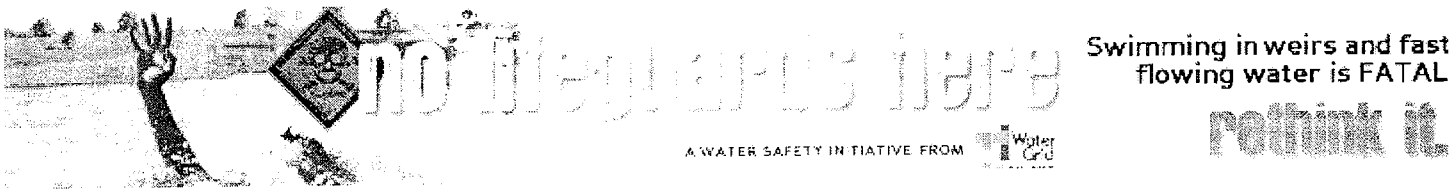
About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



This email, together with any attachments, is intended for the named recipient(s) only, and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
[redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane

Post: PO Box 16205, City East QLD 4002

[redacted]

From: Dan Spiller
Sent: Monday, 10 January 2011 7:14 AM
To: SEQWGM Media
Subject: FW: FW: slight amendment - media update

Categories: T8

Go

-----Original Message-----
From: Colin Jense[redacted]
Sent: Monday, 10 January 2011 7:14 AM
To: Dan Spiller
Cc: Barry Dennien
Subject: Re: FW: slight amendment - media update

Dan

Thanks - that's fine as an initial statement

Regards

Colin Jensen
Chief Executive Officer
Brisbane City Council
GPO Box 1434 | Brisbane Qld 4001
Level 23, Brisbane Square | 266 George Street, Brisbane, Qld 4000
Phone: [redacted]
Email: colin.jensen[redacted]
>>> Dan Spille[redacted] > 10/01/11 6:59 AM >>>
Colin,

As discussed, proposed media release below. We intend to issue this within the next 15 minutes, provided that you have not major concerns.

We are speaking to your media team directly also.

We will provide more technical advice soon.

Regards,
Dan

Media update - 10 January 2011
Wivenhoe Dam releases
Significant rainfall received across catchments has lifted Wivenhoe Dam's level to above 140 per cent and Somerset Dam to above 150 per cent. Although releases are being made, significant quantities of water have been held back to manage impacts downstream and allow for inflows which have occurred below Wivenhoe Dam.

Overnight, this weather has inundated Fernvale Bridge and Mt Crosby Weir bridge together with a number of local roads. They join a number of other bridges already impacted, including Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing. These bridges are expected to be inundated until at least Sunday.

In order to relieve the dam's flood storage compartment and with more rain forecast, controlled releases are being increased today. This will be done in consultation with the Bureau of Meteorology

and local councils, utilising a strategy to limit impacts where possible downstream, noting that these releases are a necessity.

Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact telephone - 1800 613 122. This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on potential impacts in their local areas should direct inquiries to their local councils.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au<http://www.watergrid.com.au>

For further details contact the SEQ Water Grid Communications Unit on:

P[redacted] Email[redacted]

cid:image001.gif@01CBB092.FE00A500]

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

****
This message has passed through an insecure network.
Please direct all enquiries to the message author.
****

****
This message has passed through an insecure network.
Please direct all enquiries to the message author.
****

[redacted]

From: SEQWGM Media
Sent: Monday, 10 January 2011 7:15 AM
Subject: Media Update - Dam Releases - 10 January 2011

Categories: T8

Media update – 10 January 2011

Wivenhoe Dam releases

Significant rainfall received across catchments has lifted Wivenhoe Dam's level to above 140 per cent and Somerset Dam to above 150 per cent. Although releases are being made, significant quantities of water have been held back to manage impacts downstream and allow for inflows which have occurred below Wivenhoe Dam.

Overnight, this weather has inundated Fernvale Bridge and Mt Crosby Weir bridge together with a number of local roads. They join a number of other bridges already impacted, including Twin bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing.

In order to relieve the dam's flood storage compartment and with more rain forecast, controlled releases are being increased today from 116,000 megalitres per day to 150,000 megalitres per day. This will be done in consultation with the Bureau of Meteorology and local councils, utilising a strategy to limit impacts where possible downstream, noting that these releases are a necessity.

Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils.**

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: Best Debbie [redacted]
Sent: Monday, 10 January 2011 7:20 AM
To: Dan Spiller
Subject: Re: When suits for an update?

Categories: T8

I will ring when o get to work

----- Original Message -----
From: Dan Spiller [redacted]
To: Best Debbie
Sent: Mon Jan 10 07:13:52 2011
Subject: When suits for an update?

Daniel Spiller

Director, Operations

SEQ Water Grid Manager

Phone: [redacted] Fax [redacted] Mobile: [redacted]

Email: [redacted]

Visit: Level 15, 53 Albert Street Brisbane

Post: PO Box 16205, City East QLD 4002

ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

+----------+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
sheets of A4 paper = 1 litre of water
+----------+

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 7:53 AM
To: Rob Drury; Dan Spiller; Barry Dennien; [redacted] SEQWGM Media; debbie.best [redacted] Peter Borrows; Peter.Allen [redacted]
Subject: RE: Technical Report W35
Attachments: Technical Situation Report W35.docx

Attached report W35.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W35	Date of TSR release	10.1.2011	Time of TSR release	7am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue increasing releases to discharge flood waters but keep impact downstream to minimum.	
Strategy	• All bridges are now inundated .	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Very heavy rainfall has been recorded in the upper reaches of the Brisbane and Stanley in the last 6 hours with totals up 100 to 140mm. Totals for the last 24 hours range from 100 to 300mm.

Rainfall of similar magnitudes is expected in the 12 to 24 hours, especially around the Bremer/Warrill catchments as the system tracks south.

A severe weather warning remains current for heavy rainfall in the dam catchment areas.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 101.68 m AHD (about 500,000ML currently in storage) and rising quickly. Peak inflow to the dam is estimated to be about 4,000 m3/s based on observed rainfall and could be as high as 5,000m3/s with additional forecast rainfall. Five sluice gates are open releasing about 1,100m3/s (95,000Ml/d) into Wivenhoe Dam. At this stage the dam will reach at least 103.5 early Tuesday morning which will adversely impact areas around Kilcoy.

Since the commencement of the event on 02/01/2011approximately 100,000ML has been released from the dam into Wivenhoe, with an event total of the order of 520,000ML expected. This may increase due to the forecast rain in the next 24 to 48 hours. At this stage, releases will continue until at least Thursday.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

River levels upstream of the dam are rising quickly with significant inflow being generated from the intense heavy rainfall. Flows in the Brisbane River at Gregor's Ck have already reached 6,700m3/s and the river is still rising.

The dam level is rising again, with the current level being 69.10m AHD (1,410,000ML with about 300,00 of flood storage). Estimated peak inflow to the dam just from the Upper Brisbane R alone may reach as high as 7,500m3/s and, at this stage, the dam will reach at least 73.0 m AHD during Tuesday morning. Given the rapid increase in inflow volumes, it will be necessary to increase the release from Wivenhoe Monday morning.

The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam and, at this stage, releases will be kept below 3,500m3/s and the combined flows is the lower Brisbane will be limited to 4,000m3/s. This is below the limit of urban damages in the City reaches.

The current release rate from Wivenhoe Dam is 1,400m3/s (120,000ML/day). Gate opening will start to be increased from noon Monday and the release is expected increase to at least 2,600m3/s during Tuesday morning.

Since the commencement of the event on 02/01/2011 approximately 220,000ML has been released from the dam, with an event total approaching 1,000,000ML without further rain and as much as 1,500,000ML with forecast rainfall of (both including Somerset outflow). At this stage, releases will continue until at least Sunday 16th January 2011.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Saturday 15 January in varying degrees.

Water levels in the lower Brisbane R will be impacted by the combined flows of Lockyer Ck, Bremer River, local runoff and releases from Wivenhoe Dam.

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the updated Wivenhoe operating strategy.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	11.1.2011	**Time**		**or Event**	Change in strategy

Litsupport Brisbane

To: Rob Drury; Barry Dennien; [redacted] debbie.best [redacted] Peter Borrows; Peter.Allen [redacted]

Subject: RE: Technical Report W35

Rob,

I cannot reconcile this report with your other emails.

Your 6.14am emails stated 480,000 ML in flood storage in Wivenhoe Dam. The report states 300,000 ML. Somerset was quote at 573,000 ML total storage in the email and 500,000 ML in the email.

Your 6.36am email stated that release were at 1,753 cumecs and ramping up. The report states 1,400 cumecs.

Could you please reconcile those in a version.

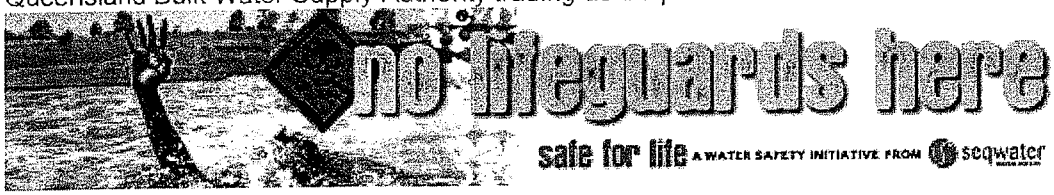
Thanks,
Dan

From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 7:53 AM
To: Rob Drury; Dan Spiller; Barry Dennien; [redacted] SEQWGM Media; debbie.best [redacted] Peter Borrows; Peter.Allen [redacted]
Subject: RE: Technical Report W35

Attached report W35.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to

this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

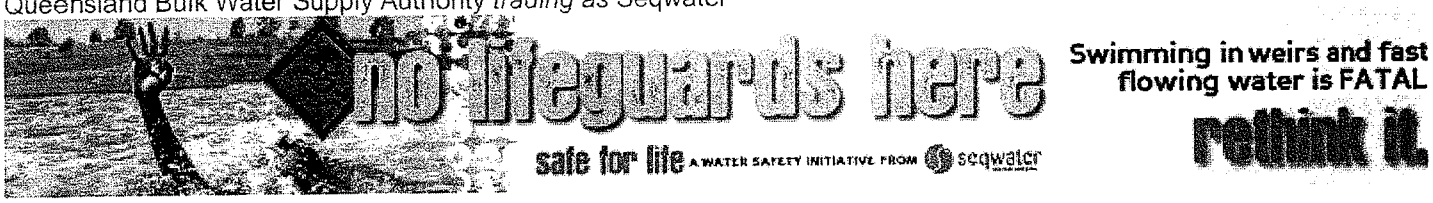
Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 8:06 AM
To: Rob Drury; Dan Spiller [redacted] Peter Borrows; Peter.Allen [redacted]
Subject: RE: Technical Report W36
Attachments: Technical Situation Report W36.docx

Please disregard the previous report, it was based on older information, this is the latest update.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

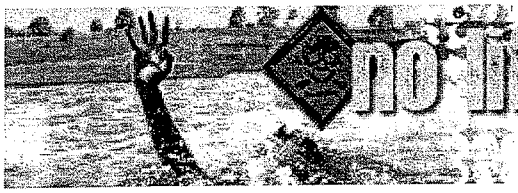
[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Monday, 10 January 2011 7:53 AM
To: Rob Drury; 'Daniel.Spiller [redacted] 'Barry.Dennier [redacted] 'media@seqwgm.com.au'; 'debbie.best [redacted]; [redacted] Peter Borrows; 'Peter.Allen [redacted]
Subject: RE: Technical Report W35

Attached report W35.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL

rethink it.

seqwater
WATER FOR LIFE

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W36	Date of TSR release	10.1.2011	Time of TSR release	8am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue increasing releases to discharge flood waters but keep impact downstream to minimum.	
Strategy	• All bridges are now inundated .	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Moderate to heavy rainfall has been recorded in the Upper Brisbane and Stanley Rivers in the last 12 hours with totals up to 90 mm. Totals for the last 24 hours range from 100 to 325mm.

Mt Glorious recorded 100 mm in the last 12 hours.

Rainfall of similar magnitudes is expected in the 12 to 24 hours around the downstream catchments as the system tracks south.

A severe weather warning remains current for heavy rainfall in the dam catchment areas.

North Pine Dam (Full Supply Level 39.60 m AHD)

The dam level was 39.97 m and steady. Five gates are open releasing 475 m3/s. The inflow into the dam since the commencement of the event is 52,000 ML. Estimated event volume is 72,000 ML assuming no further rainfall. Gate operations will continue until at least Tuesday 11 January 2011.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level at 05:00 was 102.84 m AHD and rising (storing 193,000 ML above FSL). Peak inflow to the dam is estimated to be about 4,200 m3/s based on observed rainfall and could be as high as 5,000m3/s with additional forecast rainfall. Five sluice gates are open releasing about 1,100m3/s (95,000Ml/d) into Wivenhoe Dam. At this stage the dam lake level will reach about 103.5 mAHD on Monday afternoon. Areas around Kilcoy will continue to be adversely affected.

Since the commencement of the event on 02/01/2011approximately 142,000ML has been released from the dam into Wivenhoe, with an event total of the order of 520,000ML expected. This is expected to increase due to the forecast rain in the next 24 to 48 hours. At this stage, releases will continue until at least Thursday.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

River levels upstream of the dam have peaked and are falling slowly with significant inflow being generated from the intense heavy rainfall. Flows in the Brisbane River at Gregor's Ck have peaked at 7,350m3/s at 23:00 on Sunday 9 January. This peak is bigger than January 1974 and February 1999 at this location.

The dam level is rising quickly, with the current level being 70.77m AHD (storing 450,000 ML). Estimated peak inflow to the dam just from the Upper Brisbane R is around 8,800m3/s and, at this stage, the dam will reach at least 73.3 m AHD during Tuesday morning. Given the rapid increase in inflow volumes, it was necessary to start to increase the release from Wivenhoe during Monday morning.

The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam and, at this stage, releases will be kept below 3,500m3/s and the combined flows in the lower Brisbane will be limited to 4,000m3/s if possible. This is significantly less than the current estimated combined pre-dam peak inflow of 12,000 m3/s.

Fernvale Bridge approaches and Mt Crosby Weir Bridge have been inundated and both bridges are now closed.

The current release rate from Wivenhoe Dam is 1,753m3/s (150,000ML/day). Gate opening will continue to be increased during Monday and the release is expected to increase to at least 2,600m3/s in the next 12 to 24 hours.

Since the commencement of the event on 02/01/2011 approximately 275,000ML has been released from the dam, with an event total approaching 1,600,000ML without further rain and as much as 2,100,000ML with forecast rainfall of (both including Somerset outflow). At this stage, releases will continue until at least Sunday 16th January 2011.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Saturday 15 January in varying degrees.

Water levels in the lower Brisbane R will be impacted by the combined flows of Lockyer Ck, Bremer River, local runoff and releases from Wivenhoe Dam. If the predicted rainfall eventuates in the downstream tributary catchments the resultant combined flows in the lower Brisbane may exceed the threshold of damaging discharge in the urban areas within the next 24 to 48 hours. Currently the estimate peak flow in the lower Brisbane River will be the highest since Wivenhoe Dam was completed in 1984 but still well below flows the 1974 levels.

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the updated Wivenhoe operating strategy.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate rapidly over the next 24 hours. The flood operation centre will continue to monitor the situation and provide every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury

Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator

SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time		or Event	Change in strategy

[redacted]

From: Dan Spiller
Sent: Monday, 10 January 2011 8:08 AM
To: Rob Drury
Subject: RE: Technical Report W36

Categories: T8

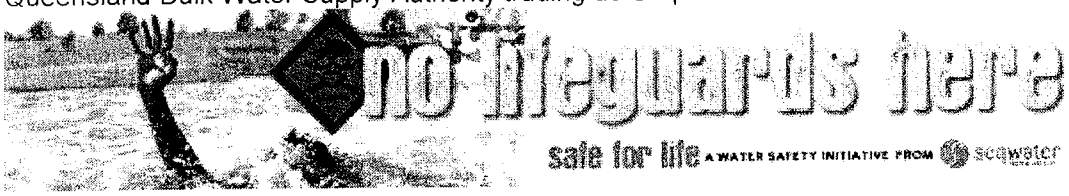
Ta. I was getting very confused.

From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 8:06 AM
To: Rob Drury; Dan Spiller; [redacted]; Peter Borrows; Peter.Allen[redacted]
Subject: RE: Technical Report W36

Please disregard the previous report, it was based on older information, this is the latest update.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Monday, 10 January 2011 7:53 AM
To: Rob Drury; 'Daniel.Spiller[redacted]'Barry.Dennien[redacted]
[redacted]'media@seqwgm.com.au'; 'debbie.best[redacted]
[redacted]; Peter Borrows; 'Peter.Allen[redacted]
Subject: RE: Technical Report W35

Attached report W35.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and f
flowing water is FAT

rethink

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Dan Spiller
Sent: Monday, 10 January 2011 8:13 AM
To: Rob Drury
Subject: RE: Technical Report W36

Categories: T8

Rob,

Are you now operating under release strategy W2 or W3?

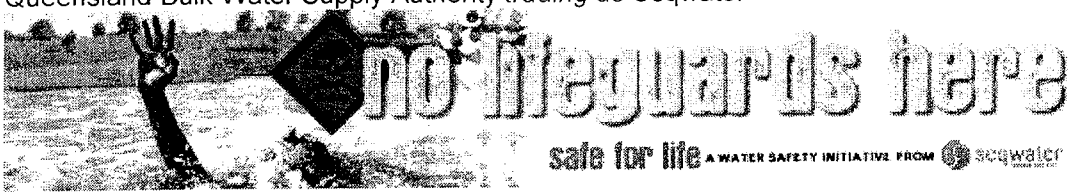
Dan

From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 8:06 AM
To: Rob Drury; Dan Spiller; [redacted] Peter Borrows; Peter.Aller[redacted]
Subject: RE: Technical Report W36

Please disregard the previous report, it was based on older information, this is the latest update.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater





seqwater
WATER FOR LIFE

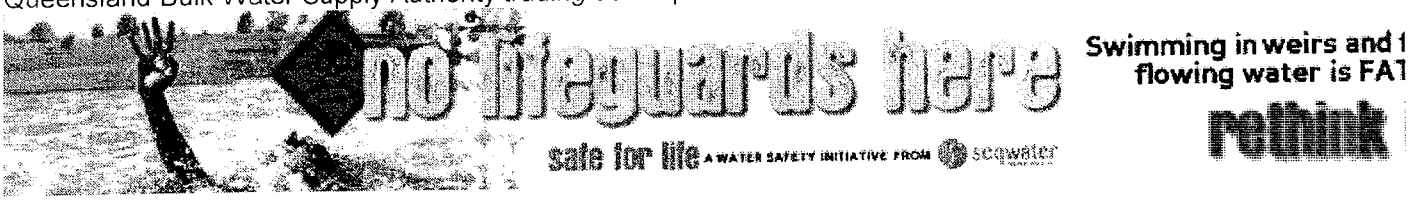
[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Monday, 10 January 2011 7:53 AM
To: Rob Drury; 'Daniel.Spiller[redacted] 'Barry.Dennien[redacted] [redacted] 'media@seqwgm.com.au'; 'debbie.best[redacted] [redacted] Peter Borrows; 'Peter.Aller[redacted]
Subject: RE: Technical Report W35

Attached report W35.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater





[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Litsupport Brisbane

Subject: Dam release update and scenarios
Location: Teleconference

Start: Mon 10/01/2011 8:30 AM
End: Mon 10/01/2011 9:00 AM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Not yet responded

Organizer: Dan Spiller
Required Attendees: Rob Drury; [redacted] Peter Borrows; Barry Dennien; [redacted]

Water Grid teleconference to discuss Wivenhoe Dam release strategy and agree related actions.

Issues include:

- Current strategy
- Potential scenarios
- Coordination with Councils
- Communications.

Details are:

Phone [redacted]
Pin: [redacted]

Alternatively, come to the Emergency Management Room at Level 15, 53 Albert Street.

We are likely to need other discussions later today with other entities.

Rob: In your hands as to whether any other people should be invited from Seqwater and Flood Control Centre.

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 8:23 AM
To: Dan Spiller
Subject: Re: Technical Report W36

W2

From: Dan Spiller [redacted]
To: Rob Drury
Sent: Mon Jan 10 08:13:29 2011
Subject: RE: Technical Report W36

Rob,

Are you now operating under release strategy W2 or W3?

Dan

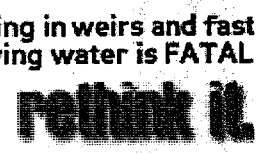
From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 8:06 AM
To: Rob Drury; Dan Spiller; [redacted] Peter Borrows; Peter.Aller [redacted]
Subject: RE: Technical Report W36

Please disregard the previous report, it was based on older information, this is the latest update.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater





seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Monday, 10 January 2011 7:53 AM
To: Rob Drury; 'Daniel.Spiller[redacted] 'Barry.Dennier[redacted]
'media@seqwgm.com.au'; 'debbie.best[redacted]
Peter Borrows; 'Peter.Allen@nrw.qld.gov.au'
Subject: RE: Technical Report W35

Attached report W35.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Best Debbie [redacted]
Sent: Monday, 10 January 2011 8:53 AM
To: Dan Spiller
Subject: Fw:

Categories: T8

----- Original Message -----
From: [redacted]
To: Best Debbie
Sent: Mon Jan 10 08:51:40 2011
Subject: RE:

Yes

-----Original Message-----
From: Best Debbie [redacted]
Sent: Monday, 10 January 2011 8:50 AM
To: Lance McCallum
Subject: Re:

Is this with minister

----- Original Message -----
From: [redacted]
To: Best Debbie
Sent: Mon Jan 10 08:04:47 2011
Subject:

10.30am?

[redacted]
Principal Advisor

Stephen Robertson MP
Minister for Natural Resources, Mines and Energy Minister for Trade
[redacted]
P Please consider the environment before printing this email

+--+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+--+

D200

Litsupport Brisbane

From: [redacted] on behalf of Barry Dennien
Sent: Monday, 10 January 2011 9:34 AM
To: Peter Borrows; Peter Baddiley; flood.qld@bom.gov.au; colin.jensen [redacted]
Dan Spiller; Barry Dennien; [redacted]

Subject: Teleconference 12.30pm today Monday 10 January 2011: CEO update on current Wivenhoe flood release strategy

Importance: High

Dear CEOs

This teleconference at 12.30pm today is to update you on the current Wivenhoe flood release strategy.

In preparation for this meeting we are intending to send out a Technical Report closer to 12.30pm that will detail the strategy.

Dial in details are:
Phone [redacted]
Pin: [redacted]

If you wish to contact me regarding this teleconference, please phone my office on (07) 3033 0786 or mobile [redacted]

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
[redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

From: Dan Spiller [redacted]
Sent: Monday, January 10, 2011 9:46 AM
To: stephen.robertso[redacted] ken.smith[redacted]
[redacted]
Best Debbie[redacted]
'Martin.Peter[redacted]
Cc: Rob Drury[redacted]
SEQWGM Media[redacted]
damien.brown[redacted] Reilly Bob[redacted]
[redacted]
Subject: Water Grid operations update
Attach: Technical Situation Report W36.docx

All,

Current situation report attached. We are distributing this version of the Technical Support Report to Councils and BoM now. We are seeking their formal input and endorsement by 1pm, prior to finalising and speaking publicly to our release strategy.

For dam operations, key points are:

- There is continuing heavy rainfall in catchments. Total inflows will be at least 1,500,000 ML and probably above 2,100,000 ML.
- As a result, Wivenhoe Dam is above 140% of capacity and Somerset is above 150%, with both rising fast.
- As specified in the approved Operational Procedures, the primary objective is now to minimizing the risk of urban inundation (release strategy W2). This involves larger releases now, minimizing the risk of even larger releases later (were the flood compartment to reach high levels).
- Consistent with this release strategy, dam releases have increased to 1,750 cubic metres per second (150,000 ML/day). It is expected to increase to 2,600 cubic metres per second by midday tomorrow.
- As specified in the approved Operational Manual, we are targeting maximum flow in the Brisbane River of 3,500 cumecs at Moggill. This is the levels above which urban inundation begins.
- For comparison, flows would be up to 12,000 cumecs without the dams.

For water treatment, key points are:

- Key facilities are operating and reservoir levels are high. Mt Crosby WTP is producing at 250 ML/day and desalination at one-third of capacity.
- There are a range of smaller plants that have been impacts, due to inundation of infrastructure, connections or stranding of operators. We are working through these issues and will advise if any become critical.

Please call me on [redacted] if you require any further information.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]

Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

TECHNICAL SITUATION REPORT

TSR Number	W36	Date of TSR release	10.1.2011	Time of TSR release	8am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue increasing releases to discharge flood waters but keep impact downstream to minimum.	
Strategy	• All bridges are now inundated .	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Moderate to heavy rainfall has been recorded in the Upper Brisbane and Stanley Rivers in the last 12 hours with totals up to 90 mm. Totals for the last 24 hours range from 100 to 325mm.

Mt Glorious recorded 100 mm in the last 12 hours.

Rainfall of similar magnitudes is expected in the 12 to 24 hours around the downstream catchments as the system tracks south.

A severe weather warning remains current for heavy rainfall in the dam catchment areas.

North Pine Dam (Full Supply Level 39.60 m AHD)

The dam level was 39.97 m and steady. Five gates are open releasing 475 m3/s. The inflow into the dam since the commencement of the event is 52,000 ML. Estimated event volume is 72,000 ML assuming no further rainfall. Gate operations will continue until at least Tuesday 11 January 2011.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level at 05:00 was 102.84 m AHD and rising (storing 193,000 ML above FSL). Peak inflow to the dam is estimated to be about 4,200 m3/s based on observed rainfall and could be as high as 5,000m3/s with additional forecast rainfall. Five sluice gates are open releasing about 1,100m3/s (95,000Ml/d) into Wivenhoe Dam. At this stage the dam lake level will reach about 103.5 mAHD on Monday afternoon. Areas around Kilcoy will continue to be adversely affected.

Since the commencement of the event on 02/01/2011approximately 142,000ML has been released from the dam into Wivenhoe, with an event total of the order of 520,000ML expected. This is expected to increase due to the forecast rain in the next 24 to 48 hours. At this stage, releases will continue until at least Thursday.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

River levels upstream of the dam have peaked and are falling slowly with significant inflow being generated from the intense heavy rainfall. Flows in the Brisbane River at Gregor's Ck have peaked at 7,350m3/s at 23:00 on Sunday 9 January. This peak is bigger than January 1974 and February 1999 at this location.

The dam level is rising quickly, with the current level being 70.77m AHD (storing 450,000 ML). Estimated peak inflow to the dam just from the Upper Brisbane R is around 8,800m3/s and, at this stage, the dam will reach at least 73.3 m AHD during Tuesday morning. Given the rapid increase in inflow volumes, it was necessary to start to increase the release from Wivenhoe during Monday morning.

The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam and, at this stage, releases will be kept below 3,500m3/s and the combined flows in the lower Brisbane will be limited to 4,000m3/s if possible. This is significantly less than the current estimated combined pre-dam peak inflow of 12,000 m3/s.

Fernvale Bridge approaches and Mt Crosby Weir Bridge have been inundated and both bridges are now closed.

The current release rate from Wivenhoe Dam is 1,753m3/s (150,000ML/day). Gate opening will continue to be increased during Monday and the release is expected to increase to at least 2,600m3/s in the next 12 to 24 hours.

Since the commencement of the event on 02/01/2011 approximately 275,000ML has been released from the dam, with an event total approaching 1,600,000ML without further rain and as much as 2,100,000ML with forecast rainfall of (both including Somerset outflow). At this stage, releases will continue until at least Sunday 16th January 2011.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Saturday 15 January in varying degrees.

Water levels in the lower Brisbane R will be impacted by the combined flows of Lockyer Ck, Bremer River, local runoff and releases from Wivenhoe Dam. If the predicted rainfall eventuates in the downstream tributary catchments the resultant combined flows in the lower Brisbane may exceed the threshold of damaging discharge in the urban areas within the next 24 to 48 hours. Currently the estimate peak flow in the lower Brisbane River will be the highest since Wivenhoe Dam was completed in 1984 but still well below flows the 1974 levels.

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the updated Wivenhoe operating strategy.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate rapidly over the next 24 hours. The flood operation centre will continue to monitor the situation and provide every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury

Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator

SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time		or Event	Change in strategy

Litsupport Brisbane

From: Dan Spiller
Sent: Monday, 10 January 2011 9:57 AM
To: Rob Drury; Peter Borrows
Cc: Barry Dennien
Subject: Technical Situation Report W36 (3)
Attachments: Technical Situation Report W36 (3).docx

Rob and Peter,

I am about to send the TSR to Colin Jensen for BCC input. Before doing so, I have amended it based on my understanding of our conversation. Can you please confirm that the changes reflect your strategy?

Dan

TECHNICAL SITUATION REPORT

TSR Number	W36	Date of TSR release	10.1.2011	Time of TSR release	8am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue increasing releases to discharge flood waters but keep impact downstream to minimum.	
Strategy	• All bridges are now inundated .	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Moderate to heavy rainfall has been recorded in the Upper Brisbane and Stanley Rivers in the last 12 hours with totals up to 90 mm. Totals for the last 24 hours range from 100 to 325mm.

Mt Glorious recorded 100 mm in the last 12 hours.

Rainfall of similar magnitudes is expected in the 12 to 24 hours around the downstream catchments as the system tracks south.

A severe weather warning remains current for heavy rainfall in the dam catchment areas.

North Pine Dam (Full Supply Level 39.60 m AHD)

The dam level was 39.97 m and steady. Five gates are open releasing 475 m3/s. The inflow into the dam since the commencement of the event is 52,000 ML. Estimated event volume is 72,000 ML assuming no further rainfall. Gate operations will continue until at least Tuesday 11 January 2011.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level at 05:00 was 102.84 m AHD and rising (storing 193,000 ML above FSL). Peak inflow to the dam is estimated to be about 4,200 m3/s based on observed rainfall and could be as high as 5,000m3/s with additional forecast rainfall. Five sluice gates are open releasing about 1,100m3/s (95,000Ml/d) into Wivenhoe Dam. At this stage the dam lake level will reach about 103.5 mAHD on Monday afternoon. Areas around Kilcoy will continue to be adversely affected.

Since the commencement of the event on 02/01/2011approximately 142,000ML has been released from the dam into Wivenhoe, with an event total of the order of 520,000ML expected. This is expected to increase due to the forecast rain in the next 24 to 48 hours. At this stage, releases will continue until at least Thursday.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

River levels upstream of the dam have peaked and are falling slowly with significant inflow being generated from the intense heavy rainfall. Flows in the Brisbane River at Gregor's Ck have peaked at 7,350m3/s at 23:00 on Sunday 9 January. This peak is bigger than January 1974 and February 1999 at this location.

The dam level is rising quickly, with the current level being 70.77m AHD (storing 450,000 ML). Estimated peak inflow to the dam just from the Upper Brisbane R is around 8,800m3/s and, at this stage, the dam will reach at least 73.3 m AHD during Tuesday morning. Given the rapid increase in inflow volumes, it was necessary to start to increase the release from Wivenhoe during Monday morning.

The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam and, at this stage, ~~releases will be kept below 3,500m3/s and the~~ combined flows in the lower Brisbane will be limited to 34,5000m3/s if possible. Consistent with the approved Operating Procedures, these target combined flows may need to be increased to 4,000m3/s, and potentially higher. In either case, t~~T~~his is significantly less than the current estimated combined pre-dam peak inflow of 12,000 m3/s.

Fernvale Bridge approaches and Mt Crosby Weir Bridge have been inundated and both bridges are now closed.

The current release rate from Wivenhoe Dam is 1,753m3/s (150,000ML/day). Gate opening will continue to be increased during Monday and the release is expected to increase to at least 2,600m3/s in the next 12 to 24 hours.

Since the commencement of the event on 02/01/2011 approximately 275,000ML has been released from the dam, with an event total approaching 1,600,000ML without further rain and as much as 2,100,000ML with forecast rainfall of (both including Somerset outflow). At this stage, releases will continue until at least Sunday 16th January 2011.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Saturday 15 January in varying degrees.

Water levels in the lower Brisbane R will be impacted by the combined flows of Lockyer Ck, Bremer River, local runoff and releases from Wivenhoe Dam. If the predicted rainfall eventuates in the downstream tributary catchments the resultant combined flows in the lower Brisbane may exceed the threshold of damaging discharge in the urban areas within the next 24 to 48 hours. Currently the estimate peak flow in the lower Brisbane River will be the highest since Wivenhoe Dam was completed in 1984 but still well below flows the 1974 levels.

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the updated Wivenhoe operating strategy.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate rapidly over the next 24 hours. The flood operation centre will continue to monitor the situation and provide every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs

SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time		or Event	Change in strategy

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 10:02 AM
To: Dan Spiller; Barry Dennien
Subject: FW: Answers to questions from teleconference

Peter Borrows asked me to forward these on.

In response to the queries raised

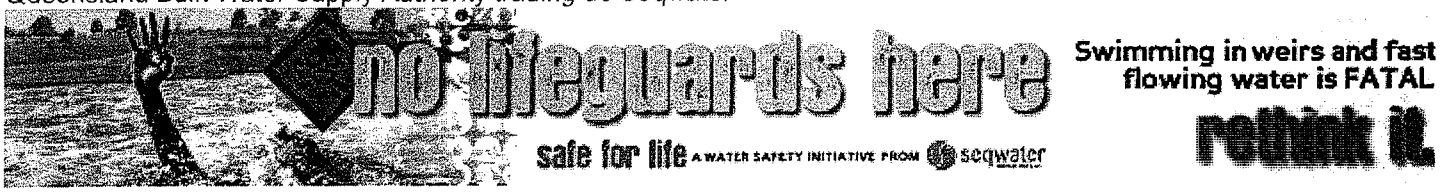
- The current operational strategy is to aim for a flow of no greater than 3,500cumecs in the lower Brisbane River. Accordingly, the current outflow from Wivenhoe Dam will be held at its current level of 2000 cumecs for the next 12 to 24 hours to allow for potential high flows from the Lockyer, Bremer and local area catchments to pass downstream. However this strategy may need to be revised at short notice if further significant rainfall occurs.

- It would require in the order of 50mm of rain across the Brisbane River Basin (this includes the Brisbane, Stanley, Lockyer and Bremer catchments) to go beyond the current operational strategy, however this depends on the spatial distribution, intensity and duration of the rainfall. This amount of rain is possible under current BOM forecasts.

- If there is a need to go beyond 3,500cumecs in the lower Brisbane around 24 hours notice should be able to be provided to BOM and BCC.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to

this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

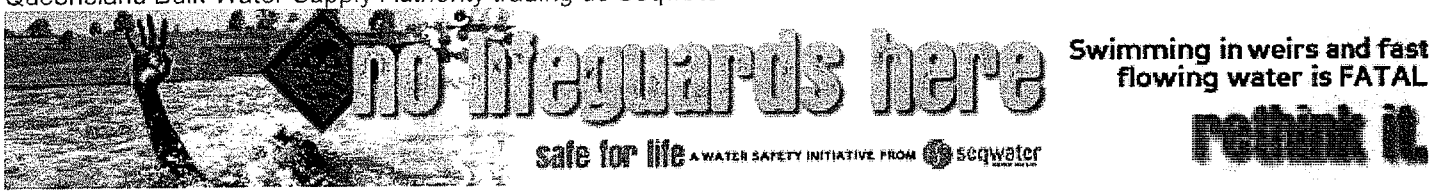
Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 10:05 AM
To: Dan Spiller; Peter Borrows
Subject: FW: Technical Situation Report W36 (3)
Attachments: Technical Situation Report W36 (3).docx

Dan,
Some slight changes based on what I sent in response to the questions and updating the release rates as now.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Dan Spiller [redacted]
Sent: Monday, 10 January 2011 9:57 AM
To: Rob Drury; Peter Borrows
Cc: Barry Dennien
Subject: Technical Situation Report W36 (3)

Rob and Peter,

I am about to send the TSR to Colin Jensen for BCC input. Before doing so, I have amended it based on my understanding of our conversation. Can you please confirm that the changes reflect your strategy?

Dan

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being

infected by a computer virus or other contamination. Unless stated otherwise. this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W36	Date of TSR release	10.1.2011	Time of TSR release	8am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue increasing releases to discharge flood waters but keep impact downstream to minimum.	
Strategy	• All bridges are now inundated .	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Moderate to heavy rainfall has been recorded in the Upper Brisbane and Stanley Rivers in the last 12 hours with totals up to 90 mm. Totals for the last 24 hours range from 100 to 325mm.

Mt Glorious recorded 100 mm in the last 12 hours.

Rainfall of similar magnitudes is expected in the 12 to 24 hours around the downstream catchments as the system tracks south.

A severe weather warning remains current for heavy rainfall in the dam catchment areas.

North Pine Dam (Full Supply Level 39.60 m AHD)

The dam level was 39.97 m and steady. Five gates are open releasing 475 m3/s. The inflow into the dam since the commencement of the event is 52,000 ML. Estimated event volume is 72,000 ML assuming no further rainfall. Gate operations will continue until at least Tuesday 11 January 2011.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level at 05:00 was 102.84 m AHD and rising (storing 193,000 ML above FSL). Peak inflow to the dam is estimated to be about 4,200 m3/s based on observed rainfall and could be as high as 5,000m3/s with additional forecast rainfall. Five sluice gates are open releasing about 1,100m3/s (95,000Ml/d) into Wivenhoe Dam. At this stage the dam lake level will reach about 103.5 mAHD on Monday afternoon. Areas around Kilcoy will continue to be adversely affected.

Since the commencement of the event on 02/01/2011approximately 142,000ML has been released from the dam into Wivenhoe, with an event total of the order of 520,000ML expected. This is expected to increase due to the forecast rain in the next 24 to 48 hours. At this stage, releases will continue until at least Thursday.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

River levels upstream of the dam have peaked and are falling slowly with significant inflow being generated from the intense heavy rainfall. Flows in the Brisbane River at Gregor's Ck have peaked at 7,350m3/s at 23:00 on Sunday 9 January. This peak is bigger than January 1974 and February 1999 at this location.

The dam level is rising quickly, with the current level being 70.77m AHD (storing 450,000 ML). Estimated peak inflow to the dam just from the Upper Brisbane R is around 8,800m3/s and, at this stage, the dam will reach at least 73.3 m AHD during Tuesday morning. Given the rapid increase in inflow volumes, it was necessary to start to increase the release from Wivenhoe during Monday morning.

The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam and, at this stage, ~~releases will be kept below 3,500m3/s and the~~ the aim is to keep combined flows in the lower Brisbane to 3,500cumecs~~will be limited to 34, 5000m3/s~~ if possible. Consistent with the approved Operating Procedures, these target combined flows may need to be increased to 4,000m3/s, and potentially higher. In either case, t~~T~~his is significantly less than the current estimated combined pre-dam peak inflow of 12,000 m3/s.

Fernvale Bridge approaches and Mt Crosby Weir Bridge have been inundated and both bridges are now closed.

The current release rate from Wivenhoe Dam is around 2,000~~1,753~~m3/s (17~~250~~,000ML/day). Gate opening will continue to be increased during Monday and the release is expected to increase to at least 2,600m3/s in the next 12 to 24 hours and further depending on downstream flows..

Since the commencement of the event on 02/01/2011 approximately 275,000ML has been released from the dam, with an event total approaching 1,600,000ML without further rain and as much as 2,100,000ML with forecast rainfall of (both including Somerset outflow). At this stage, releases will continue until at least Sunday 16th January 2011.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Saturday 15 January in varying degrees.

Water levels in the lower Brisbane R will be impacted by the combined flows of Lockyer Ck, Bremer River, local runoff and releases from Wivenhoe Dam. If the predicted rainfall eventuates in the downstream tributary catchments the resultant combined flows in the lower Brisbane may exceed the threshold of damaging discharge in the urban areas within the next 24 to 48 hours. Currently the estimate peak flow in the lower Brisbane River will be the highest since Wivenhoe Dam was completed in 1984 but still well below flows the 1974 levels.

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the updated Wivenhoe operating strategy.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate rapidly over the next 24 hours. The flood operation centre will continue to monitor the situation and provide every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs

SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	11.1.2011	**Time**		**or Event**	Change in strategy

[redacted]

From: [redacted]
Sent: Monday, 10 January 2011 10:08 AM
To: Dan Spiller; Barry Dennien

Categories: T8

Hi Barry and Dan,

Please see the update approved by Mike and [redacted] to send shortly, [redacted]

Thanks [redacted]

Media update – 10 January 2011

Dam releases

Significant rainfall across the catchments has lifted Wivenhoe Dam's level to above 140 per cent and Somerset Dam to above 150 per cent. Although releases are being made, large quantities continue to flow into the dams and are being held back in order to manage impacts downstream and allow for other inflows which have occurred below Wivenhoe Dam. i.e. From the Lockyer and Bremer Rivers and urban runoff.

Overnight, Fernvale and Mt Crosby Weir Bridges together with a number of local roads became inundated. They joined the others already impacted, including Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing.

In order to relieve Wivenhoe's quickly filling flood storage compartment and with more rain forecast, controlled releases from the dam are being increased today from 116,000 megalitres per day to 150,000 megalitres per day into the Brisbane River. This will be done in consultation with the Bureau of Meteorology and local councils, utilising a strategy to limit impacts where possible downstream. These releases are a necessity.

Water from Somerset Dam is being released into Wivenhoe Dam through the sluice gates.

Spillway gate operations are continuing at North Pine Dam, with all five gates open. These releases may continue until next week, depending upon further rainfall.

At Leslie Harrison Dam, gate releases are underway and a minor release of around 1200 megalitres a day is being made through the emergency gates of Hinze Dam.

The Water Grid is working with local councils regarding the current releases and the likely impacts, which are being managed in accordance with approved flood management plans.

For further information on dam releases please visit www.watergrid.com.au.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

Recreation update

Due to water levels, both Wivenhoe and Somerset are closed to all recreational activities, and will remain so for some days.

The following recreation sites are closed –

- O'Sheas Crossing
- Hamon Cove
- Logan Inlet
- Captain Logan Camp
- Lumley Hill
- Spillway Common/ Atkinson's Crossing
- Cormorant Bay
- Branch Creek
- Billies Bay/Hays Landing
- The Spit
- Lake Somerset Holiday Park Kirkleagh

Numerous roads are cut including the highway at Kilcoy and Fernvale, and conditions are extremely dangerous.

Moogerah and Maroon Dam remains open, however, swimming and skiing should be avoiding.

Access to Borumba Dam is currently not available as Yabba Creek Road between Imbil and Borumba Dam is closed.

Lake Baroon has also been closed to all water based recreational activities but is open for picnics and barbeques. Care should be taken at the recreation sites, and vehicles must be parked in designated parking areas only.

Visitors should check the Water Grid website (www.watergrid.com.au) for additional information for each recreation site.

Gold Coast Desalination Plant

Even though the regions dams are at or near full capacity, recent heavy rains have resulted in high sediment levels in the Brisbane River. These increased levels may present challenges for water treatment plants like those at Mt Crosby, which are the main supply for Brisbane.

The Gold Coast Desalination facility was recently brought up to full capacity to address the flood associated issues at Mt Crosby without compromising water security or quality for Brisbane.

With Mt Crosby now back to normal the Gold Coast Desalination facility has now been reduced to 33 per cent capacity.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils.**

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

Litsupport Brisbane

From: Dan Spiller
Sent: Monday, 10 January 2011 10:09 AM
To: [redacted]
Cc: Barry Dennien; Peter Borrows
Subject: Technical Situation Report
Attachments: Technical Situation Report W37.docx

Colin,

Further to our discussion, attached is the Technical Situation Report drafted by Seqwater following consultation with BoM and Councils.

Key points are:

- There is continuing heavy rainfall in catchments. Total inflows over the event will be at least 1,500,000 ML and probably above 2,100,000 ML.
- As a result, Wivenhoe Dam is above 140% of capacity and Somerset is above 150%, with both rising fast.
- As specified in the approved Operational Procedures, the primary objective is now to minimizing the risk of urban inundation (release strategy W2). This involves larger releases now, minimizing the risk of even larger releases later (were the flood compartment to reach high levels).
- Consistent with this release strategy, dam releases have increased to 2,000 cubic metres per second (172,000 ML/day). It is expected to increase to 2,600 cubic metres per second by midday tomorrow.
- As specified in the approved Operational Manual, we are targeting maximum flow in the Brisbane River of 3,500 cumecs at Moggill. This is the levels above which urban inundation begins.
- For comparison, flows would be up to 12,000 cumecs without the dams.

Seqwater has previously had verbal conversations with BCC staff regarding impacts. However, given the significance of this event, and consistent with the draft protocol, we are seeking formal BCC input to this version. This advice would relate to the impact of releases, based on the type of scenario analysis that you described this morning.

Our preference would be to finalise the report, including your input, before or at the 12.30 teleconference with Council CEOs and the BoM. This timing means that it can underpin all media messaging this afternoon.

I appreciate your assistance. Please call me if I can be of any assistance.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

TECHNICAL SITUATION REPORT

TSR Number	W36	Date of TSR release	10.1.2011	Time of TSR release	8am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue increasing releases to discharge flood waters but keep impact downstream to minimum.	
Strategy	• All bridges are now inundated .	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Moderate to heavy rainfall has been recorded in the Upper Brisbane and Stanley Rivers in the last 12 hours with totals up to 90 mm. Totals for the last 24 hours range from 100 to 325mm.

Mt Glorious recorded 100 mm in the last 12 hours.

Rainfall of similar magnitudes is expected in the 12 to 24 hours around the downstream catchments as the system tracks south.

A severe weather warning remains current for heavy rainfall in the dam catchment areas.

North Pine Dam (Full Supply Level 39.60 m AHD)

The dam level was 39.97 m and steady. Five gates are open releasing 475 m3/s. The inflow into the dam since the commencement of the event is 52,000 ML. Estimated event volume is 72,000 ML assuming no further rainfall. Gate operations will continue until at least Tuesday 11 January 2011.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level at 05:00 was 102.84 m AHD and rising (storing 193,000 ML above FSL). Peak inflow to the dam is estimated to be about 4,200 m3/s based on observed rainfall and could be as high as 5,000m3/s with additional forecast rainfall. Five sluice gates are open releasing about 1,100m3/s (95,000Ml/d) into Wivenhoe Dam. At this stage the dam lake level will reach about 103.5 mAHD on Monday afternoon. Areas around Kilcoy will continue to be adversely affected.

Since the commencement of the event on 02/01/2011approximately 142,000ML has been released from the dam into Wivenhoe, with an event total of the order of 520,000ML expected. This is expected to increase due to the forecast rain in the next 24 to 48 hours. At this stage, releases will continue until at least Thursday.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

River levels upstream of the dam have peaked and are falling slowly with significant inflow being generated from the intense heavy rainfall. Flows in the Brisbane River at Gregor's Ck have peaked at 7,350m3/s at 23:00 on Sunday 9 January. This peak is bigger than January 1974 and February 1999 at this location.

The dam level is rising quickly, with the current level being 70.77m AHD (storing 450,000 ML). Estimated peak inflow to the dam just from the Upper Brisbane R is around 8,800m3/s and, at this stage, the dam will reach at least 73.3 m AHD during Tuesday morning. Given the rapid increase in inflow volumes, it was necessary to start to increase the release from Wivenhoe during Monday morning.

The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam and, at this stage, the aim is to keep combined flows in the lower Brisbane to 3,500m3/sec if possible. Consistent with the approved Operating Procedures, these target combined flows may need to be increased to 4,000m3/s, and potentially higher. In either case, this is significantly less than the current estimated combined pre-dam peak inflow of 12,000 m3/s.

Fernvale Bridge approaches and Mt Crosby Weir Bridge have been inundated and both bridges are now closed.

The current release rate from Wivenhoe Dam is around 2,000m3/s (172,000ML/day). Gate opening will continue to be increased during Monday and the release is expected to increase to at least 2,600m3/s in the next 12 to 24 hours and further depending on downstream flows..

Since the commencement of the event on 02/01/2011 approximately 275,000ML has been released from the dam, with an event total approaching 1,600,000ML without further rain and as much as 2,100,000ML with forecast rainfall of (both including Somerset outflow). At this stage, releases will continue until at least Sunday 16th January 2011.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Saturday 15 January in varying degrees.

Water levels in the lower Brisbane R will be impacted by the combined flows of Lockyer Ck, Bremer River, local runoff and releases from Wivenhoe Dam. If the predicted rainfall eventuates in the downstream tributary catchments the resultant combined flows in the lower Brisbane may exceed the threshold of damaging discharge in the urban areas within the next 24 to 48 hours. Currently the estimate peak flow in the lower Brisbane River will be the highest since Wivenhoe Dam was completed in 1984 but still well below flows the 1974 levels.

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the updated Wivenhoe operating strategy.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate rapidly over the next 24 hours. The flood operation centre will continue to monitor the situation and provide every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury

Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator

SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time		or Event	Change in strategy

[redacted]

From: SEQWGM Media
Sent: Monday, 10 January 2011 10:21 AM
Subject: SEQ Water Grid Media Report - 10 January 2011
Attachments: SEQ Water Grid Media Report - 10 January 2011.pdf

Importance: High

Categories: T8

Hi team

Please see attached today's media report. Coverage over the weekend included the following:

Dams / rainfall / flooding

- All five Wivenhoe Dam gates were opened at the weekend, with releases into the Brisbane River set to continue over the next couple of days. About 116,000ML of water a day is being released from Wivenhoe Dam and releases are expected to change at short notice. The Bureau of Meteorology is predicting rain to last until the coming weekend. (Courier Mail, ABC 612 Brisbane, 4KQ Brisbane, Queensland Times)
- Queensland's flood focus has turned to the southeast, with Maryborough, Gympie, Wide Bay, Kingaroy and Cooloola in flood and Brisbane in the firing line. Emergency information: Flood warnings mentioning areas surrounding Wivenhoe Dam (Courier Mail, Gympie Times, ABC Brisbane, Sunshine Coast, Gold Coast and Tweed Coast, Channel 7)
- Police were forced to close sections of the Bruce Highway at 10 o'clock last night as almost 3,000 homes were left without power as Queensland's flood crisis moved to the southeast corner (Courier Mail)
- The major highway north of Brisbane was cut last night and almost 3000 homes were left without power as Queensland's flood crisis moved to the southeast corner (Courier Mail)
- Due to high levels of algal toxins present in raw water samples, council's day use area at Cooby Dam Wall is closed to public access until further notice (Toowoomba Chronicle)

State Government

- Tony Abbott's proposal to build more dams to manage future floods and store water has been dismissed as simplistic by federal Labor environmentalists and researchers. Prime Minister Julia Gillard says a number of dams aren't the answer to floods like the one that's hit Queensland (AAP Newswire, Brisbane Times, 4BC Brisbane, Courier Mail, Brisbane Times)

SEQ Water Grid

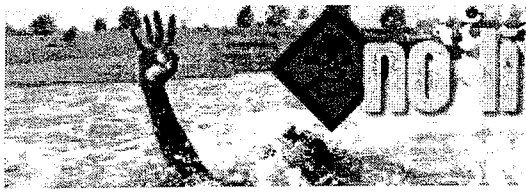
- Logan City and parts of Brisbane have been using water pumped from the Gold Coast Desalination Plant as flood waters have washed soil from agricultural land into South East catchments (ABC 612 Brisbane, ABC Gold and Tweed Coasts)
- The Northern Pipeline Interconnector works have been delayed due to inclement weather on the Sunshine Coast (Sunshine Coast Daily)
- Letter to the editor detailing that it is a good thing that we have the Wivenhoe to Cressbrook pipeline now, for if and when we have another drought we'll always have water (Toowoomba Chronicle)

Desalination

- Logan City and parts of Brisbane have been using water pumped from the Tugun Desalination Plant. Dan Spiller, South East Queensland Water Grid, says flood waters have washed soil from agricultural land into south east catchments (ABC Brisbane and Gold and Tweed Coasts)

SEQ Water Grid Communications Unit

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.



no lifeguards here

A WATER SAFETY INITIATIVE FROM

Swimming in weirs and
flowing water is FA

rethink

D231

MEDIA MONITORS

SEQ Water Grid Media Report - 10 January 2011

AM Radio

4BC (Brisbane)
Weekend Mornings - 8/01/2011 8:27 AM
Ian Maurice
Station Phone 07 3908 8200

Audience	
Male 16+:	13,000
Female 16+:	19,000
All People:	31,000
Advertising Space Rate	
AUD:	6,184

Regular segment: Fishing with David Downie. Downie discusses the Logan River and the amount of rubbish on the shoreline. Downie mentions a sewage treatment plant that can't handle the heavy rain. Downie says it is a slow process to get the local council to do anything about it. Maurice suggests making the management of local rivers a responsibility of state governments. Downie says it wouldn't be a bad idea.

Interviewees: David Downie. Fishing expert
Duration: 5.42
Summary ID: W00042024187
© Media Monitors

4BC (Brisbane)
06:30 News - 10/01/2011 6:30 AM
Newsreader
News Director Mr Chris Adams 07 3908 8244

Audience	
Male 16+:	16,000
Female 16+:	22,000
All People:	39,000
Advertising Space Rate	
AUD:	751

Rain has caused flash flooding in Brisbane. Tom Saunders from the Weather Channel says there will be more rain today and that there is major flooding near the Wivenhoe Dam.

Interviewees: Tom Saunders, Weather Channel
Duration: 0.33
Summary ID: W00042028885
This program or part thereof is syndicated to the following 5 station(s):- 1071 AM (Kingaroy), 4BH (Brisbane), 4CRB FM (Gold Coast), 4LG (Longreach), Radio 4KZ (Innisfail)
© Media Monitors

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

4BC (Brisbane)
Greg Cary Morning Show - 7/01/2011 9:46 AM
Gary Hardgrave
Station Phone 07 3908 8200

Audience	
Male 16+:	13,000
Female 16+:	16,000
All People:	29,000
Advertising Space Rate	
AUD:	8,018

Hardgrave speaks to Tony Abbott, Federal Opposition Leader who has spent a few days in Qld surveying flood damage, and says that agricultural businesses and fishing co-ops have been badly affected. Abbott says it could take years for such businesses to recover. Abbott goes on to describe his visits to Emerald and Dalby, but says these floods should make people reconsider their attitude to dams as a flood mitigation device and a source of zero emissions electricity. Abbott says the Opposition has previously had a proposal to set aside $500m for new infrastructure to increase water capacity because the Green movement has caused 'dam phobia' in Australia. Hardgrave says Anna Bligh wants to focus on the recovery effort rather than have a debate about dams, and Abbott says Australia can deal with the floods and think about the future at the same time. Hardgrave says that Wivenhoe Dam has flood-proofed most of the Brisbane valley, but it is bizarre that there are not similar treatments in the Fitzroy and the Dawson system. Abbott says infrastructure has not kept pace with other national developments, and believes there are better things to spend $50bn of tax payer's money on than the National Broadband Network, which is the only sad vision being provided by the Gillard Government. Hardgrave notes that Ted Baillieu, Victorian Premier is not in favour of more dams on the Murray Darling system, and Abbott says it is important that new water storages are back on the agenda.

Interviewees: Tony Abbott, Federal Opposition Leader
Duration: 7.54
Summary ID: W000420112 54
This program or part thereof is syndicated to the following 6 station(s):-
4BU (Bundaberg), 4LG (Longreach), 4RO (Rockhampton), 4VL (Charleville), 4WK (Toowoomba), Radio 4KZ (Innisfail)
© Media Monitors

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

4BC (Brisbane)
Drive - 7/01/2011 3:10 PM
Geoff Mullins
Producer Mr Aaron O'Brien 07 3908 8200

Audience	
Male 16+:	11,000
Female 16+:	11,000
All People:	22,000
Advertising Space Rate	
AUD:	6,250

Interview with Libby Connors, Queensland Greens Spokesperson, about a proposal from Tony Abbott, Federal Opposition Leader, to build more dams. Connors says it is a terrible idea and Abbott has made the announcement as a political game move. Mullins says it is part of a long-term plan. Connors says people towns like Condamine, Bundaberg and Rockhampton would love to do something to ease their burden and he is playing a political game. Mullins says it would not help anyone immediately and it is about long term vision. Connors talks about the bad effects of dams. Connors says there are concerns about declining fish stock in inland streams and oceans and there is a direct correlation between disruptions on a water course and fish breeding grounds. Mullins asks if experts can work that out. Connors says a lot of things that humans do have negative effects on the environment. Connors says Abbott has an agenda at work, and during the Howard years they already had the Northern Infrastructure Task Force planning to put dams in Northern Australia. Connors says they would have caused massive disruptions because of the low flowing of Australian rivers. Mullins says Anthony Albanese, Infrastructure Minister, has said that dam ideas should be judged on merit. Connors says there was a state Labor Government in Queensland trying to force the Traveston Dam in Queensland, which is an example of the social costs of dams. Mullins says the Traveston Dam was ill-conceived from the outset, and the dams that Abbott is suggesting are better-located. Connors talks about the dam on the Logan River. Connors says she was in contact with families who lost their land to the dam, and they were very sad. Connors says the Nathan Dam near Theodore was dismissed by the courts on environmental grounds but has been put back on the agenda by the mining sector. Mullins asks if the Wivenhoe Dam was a good idea. Mullins says Brisbane went underwater in 1974 and in the last month has been prevented from flooding again by the Wivenhoe Dam. Connors says it has been effective flood mitigation, and she agrees that it has beneficial effects for Brisbane although it was hard on those in the Brisbane Valley. Connors says the costs are often hidden for dams. Mullins asks how we should prevent floods without dams. Connors says she would introduce rigid planning so people do not live on flood plains and the country has always flooded. Connors says we have had hydrologists studying Australian river systems for years and there are very few places where it would be appropriate to make dams.

Interviewees: Libby Connors,

Queensland Greens Spokesperson
Duration: 8.07
Summary ID: W00042015753
© Media Monitors

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

4BC (Brisbane)
Drive - 7/01/2011 3:29 PM
Geoff Mullins
Producer Mr Aaron O'Brien 07 3908 8200

Audience	
Male 16+:	11,000
Female 16+:	11,000
All People:	22,000
Advertising Space Rate	
AUD:	1,181

Caller Collin is calling about dams. Collin says he suggested that the Government dig out the Wivenhoe dam when it was empty because the soil would be full of silt. Collin says Moogera Dam is a shallow dam, and its capacity could have been increased. Collin says the Government told him that the dam would have to reseal.

Duration: 1.32
Summary ID: W00042016113
© Media Monitors

4BC (Brisbane)
Drive - 7/01/2011 3:34 PM
Geoff Mullins
Producer Mr Aaron O'Brien 07 3908 8200

Audience	
Male 16+:	9,000
Female 16+:	15,000
All People:	24,000
Advertising Space Rate	
AUD:	196

Mullins reads listener responses about his interview with Libby Connors, Queensland Greens Spokesperson: SMS: Great question about Wivenhoe Dam. You showed how flimsy her anti-progress ramblings are.

Duration: 0.14
Summary ID: W00042016171
© Media Monitors

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

4BC (Brisbane)
Drive - 7/01/2011 3:48 PM
Geoff Mullins
Producer Mr Aaron O'Brien 07 3908 8200

Audience	
Male 16+:	9,000
Female 16+:	15,000
All People:	24,000
Advertising Space Rate	
AUD:	6,748

Mullins says Anna Bligh, Queensland Premier, today warned Tony Abbott, Federal Opposition Leader, not to jump the gun by starting a debate on dams because it will take the focus off flood relief efforts. Mullins says the flood relief capacity has been affected by interest payments on the Queensland debt, and Langbroek says interest on Queensland's massive debt has hit Queensland's flood relief capacity by $1.5bn. Langbroek says the interest in 2009/10 was $2.94bn and for 2011/12 it is $4.4bn. Langbroek says we would have had more money if we did not have to pay more interests from losing our triple-A credit rating. Langbroek says the debt is heading towards $85bn, which is close to what John Howard had for the whole country. Langbroek says Andrew Fraser, Queensland Treasurer, has said that we need to cut costs. Mullins says they have started selling the country off. Langbroek says Labor is kowtowing to the Green movement and Bligh is rejecting Abbott's suggestion that we look at water infrastructure. Langbroek says Bligh is president of the Federal Labor Party and has come out in tandem with Julia Gillard, Prime Minister, saying that we do not want to distract from the flood effort. Langbroek says the Wivenhoe Dam has helped prevent Brisbane flooding. Mullins asks about the meaning of the loss of the triple-A credit rating. Langbroek says it is harder to borrow the money at a good interest rate. Langbroek says interest has increased by hundreds of millions of dollars. Langbroek says it is important to understand how bad the flood has been in many parts of Queensland. Langbroek says the Liberal and National parties, as well as the LNP, have never been shied about building dams. Langbroek says Labor only built one dam in Queensland. Langbroek and Mullins discuss the two dams cancelled in Queensland, the Traveston dam and one on the Gold Coast. Mullins asks where a good place for a dam would be. Langbroek says they opposed the Traveston dam, as did Peter Garrett, former Environment Minister. Langbroek says Wayne Goss did not want the M1 between the Gold Coast and Brisbane but the LNP built it. Langbroek talks about the Traveston Dam. Langbroek says a lot of money has been wasted for the Traveston Dam. Langbroek says the Greens must never have been flooded.

Interviewees: John-Paul Langbroek, Queensland Opposition Leader
Duration: 8.02
Summary ID: W00042016310
© Media Monitors

4GR (Toowoomba)
06:30 News - 10/01/2011 6:32 AM
Newsreader
News Director Ms Missy Burrell 07 5591 4999

Audience	
Male 16+:	5,000
Female 16+:	4,800
All People:	9,800
Advertising Space Rate	
AUD:	174

Toowoomba Regional Council is worried recent repairs have been washed away with more rain. Councillor Carol Taylor says it is impacting the whole region, and flood waters are stopping assessments.

Interviewees: Carol taylor, Councillor, Toowoomba Regional Council
Duration: 0.30
Summary ID: W00042030539
This program or part thereof is syndicated to the following 1 station(s):-
C FM Toowoomba (Toowoomba)
© Media Monitors

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

4KQ (Brisbane)
06:30 News - 10/01/2011 6:31 AM
Newsreader
Station Phone 07 3394 0693

Audience	
Male 16+:	12,000
Female 16+:	13,000
All People:	24,000
Advertising Space Rate	
AUD:	1,102

South East Qld is in the grip of more torrential rain and flash flooding. Ian Patterson, Somerset Dam resident, says there has been 300mls rain there. An Emergency Alert message has been sent to Dalby residents, with Mile Creek being expected to peak. Mayor Ray Brown says flood waters are raising rapidly.

Interviewees: Ian Patterson, Somerset Dam resident; Janine Yuasa, Weather Forecaster; Ray Brown, Mayor of Dalby
Duration: 1.11
Summary ID: W00042029238
© Media Monitors

ABC 612 Brisbane (Brisbane)
Drive - 7/01/2011 4:05 PM
Kelly Higgins-Devine
Presenter Ms Kelly Higgins-Devine 07 3377 5235

Audience	
Male 16+:	16,000
Female 16+:	14,000
All People:	30,000
Advertising Space Rate	
AUD:	1,824

Emergency Information: - Flood warning for the Lockyer and Warrell Creeks, Bremer River and Brisbane River above Wivenhoe Dam. - Brisbane city road closures. - Toowoomba city road closures. - Ipswich city road closures. - Moggill ferry out of service. - Police advise many roads are damaged or closed. Use the Pacific Highway to reach NSW. - Visit Bureau of Meteorology website, call Traffic and Travel Information line, or call RACQ Road Closures line for more details.

Duration: 2.28
Summary ID: W00042016457
© Media Monitors

ABC 612 Brisbane (Brisbane)
17:00 News - 7/01/2011 5:02 PM
Newsreader
Executive Producer Ms Maree Hawthorne 07 3377 5244

Audience	
Male 16+:	18,000
Female 16+:	10,000
All People:	29,000
Advertising Space Rate	
AUD:	238

South-east Qld dams have begun releasing almost 300 gigalitres of flood storage. Seqwater says there has been additional rain over the past few days. Releases are underway at the Wivenhoe, Somerset, Hinze and North Pine dams.

Duration: 0.20
Summary ID: W00042016923
This program or part thereof is syndicated to the following 11 station(s):- ABC Capricornia (Rockhampton), ABC Far North (Cairns), ABC Gold and Tweed Coasts (Gold Coast), ABC North Queensland (Townsville), ABC North West Qld (Mt Isa), ABC Southern Queensland (Toowoomba), ABC Sunshine and Cooloola Coasts (Sunshine Coast), ABC Tropical North (Mackay), ABC Western Queensland (Longreach), ABC Wide Bay (Bundaberg), Radio National (Brisbane)
© Media Monitors

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

ABC 612 Brisbane (Brisbane)
18:00 News - 7/01/2011 6:04 PM
Newsreader
Executive Producer Ms Maree Hawthorne 07 3377 5244

Audience	
Male 16+:	19,000
Female 16+:	5,000
All People:	24,000
Advertising Space Rate	
AUD:	404

Logan City and parts of Brisbane have been using water pumped from the Tugun Desalination Plant. Dan Spiller, South East Queensland Water Grid, says flood waters have washed soil from agricultural land into south east catchments.

Interviewees: Dan Spiller, Spokesperson, South East Queensland Water Grid
Duration: 0.41
Summary ID: W00042018000
This program or part thereof is syndicated to the following 11 station(s):- ABC Capricornia (Rockhampton), ABC Far North (Cairns), ABC Gold and Tweed Coasts (Gold Coast), ABC North Queensland (Townsville), ABC North West Qld (Mt Isa), ABC Southern Queensland (Toowoomba), ABC Sunshine and Cooloola Coasts (Sunshine Coast), ABC Tropical North (Mackay), ABC Western Queensland (Longreach), ABC Wide Bay (Bundaberg), Radio National (Brisbane)
© Media Monitors

FM Radio

ABC Gold and Tweed Coasts (Gold Coast)
06:30 News - 10/01/2011 6:33 AM
Newsreader
Station Phone 07 5595 2917

Audience	
Male 16+:	2,300
Female 16+:	2,700
All People:	5,000
Advertising Space Rate	
AUD:	98

Gold Coast desalination plant is running at one third of its capacity. South East Queensland Water Grid says it was at 100% output last month. Dan Spiller, Spokesperson, SEQ Water Grid, says desalinated water was used to ease demand on treated water.

Interviewees: Dan Spiller, Spokesperson, SEQ Water Grid
Duration: 0.33
Summary ID: W00042029120
© Media Monitors

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

ABC Gold and Tweed Coasts (Gold Coast)
13:00 News - 7/01/2011 1:01 PM
Newsreader
Station Phone 07 5595 2917

Logan and parts of Brisbane have been using water pumped from the Tugun Desalination Plant during the floods. South East Qld Water Grid Spokesman Dan Spiller says flood waters have washed soil from agricultural land into South East Qld and this has restricted the capacity to treat water at the water treatment plant. He says water has been primarily supplied from the North Pine Dam, Molendinar and the Desalination Plant.

Interviewees: Dan Spiller, Spokesman, South East Qld Water Grid
Duration: 0.41
Summary ID: W00042014602
© Media Monitors

Audience	
Male 16+:	3,200
Female 16+:	2,100
All People:	5,200
Advertising Space Rate	
AUD:	126

ABC Sunshine and Cooloola Coasts (Sunshine Coast)
Drive - 7/01/2011 4:05 PM
Cam Young
Station Phone 07 5475 5000

Emergency Information: - Flood warnings for the Lockyer and Warrell Creeks, Bremer River, and the Brisbane River above Wivenhoe Dam. - Road closures around Brisbane and SE Qld. Police are advising motorists travelling between NSW and Qld to use the Pacific Highway. - More information available from the Bureau of Meteorology site, the Traffic and Travel Information line, or the RACQ Road Closures line.

Duration: 2.42
Summary ID: W00042016739
© Media Monitors

Audience	
Male 16+:	1,600
Female 16+:	2,300
All People:	3,900
Advertising Space Rate	
AUD:	374

River FM (Ipswich)
11:00 News - 7/01/2011 11:02 AM
Newsreader
Station Phone 07 3813 1000

SEQ Water says it is holding off on opening gates at the Wivenhoe Dam, waiting for levels in Lockyer Valley Creek to subside. Wayne Wendt, Member for Ipswich West, says there is no justification behind calls for the bridge to be upgraded.

Interviewees: Wayne Wendt, Member for Ipswich West
Duration: 0.45
Summary ID: W00042014625
© Media Monitors

Audience	
Male 16+:	N/A
Female 16+:	N/A
All People:	N/A
Advertising Space Rate	
AUD:	108

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

Internet

Brisbane Courier-Mail - www.couriermail.com.au
Just 4.5 hours of sunshine a day

BRISBANE'S average sunshine for December was 4.5 hours per day, the lowest since records began at the new airport site in 2000. And after days of heavy rain, forecasterss have predicted another five straight days of wet weather for Brisbane. Falls of...

Date Found: 7/01/2011 9:59 AM
Summary ID: 88072691
To view the web page: click here>>

Audience	
Unique Daily Visitors:	28,622
Av. Story Audience:	1,201
Advertising Space Rate	
AUD:	1,301

Brisbane Courier-Mail - www.couriermail.com.au
Coalition to establish dams taskforce

THE Federal Coalition is to set up a taskforce within its own ranks to develop a plan for dam building and expansion in the wake of floods in NSW and Queensland. The floods had raised "obvious questions" about better protecting people from water damage...

Date Found: 7/01/2011 1:35 PM
Summary ID: 88092071
To view the web page: click here>>

Audience	
Unique Daily Visitors:	28,622
Av. Story Audience:	1,201
Advertising Space Rate	
AUD:	1,677

Brisbane Times - news.brisbanetimes.com.au
Abbott's dam plan slammed

AAP Tony Abbott's proposal to build more dams to limit the impact of future floods and store water has been criticised as simplistic by federal Labor, environmentalists and researchers. They argue dams wouldn't necessarily have saved Queensland homes,...

Date Found: 7/01/2011 9:10 PM
Summary ID: 88125054
To view the web page: click here>>

Audience	
Unique Daily Visitors:	22,250
Av. Story Audience:	207
Advertising Space Rate	
AUD:	154

Gold Coast-Australia - www.goldcoast.com.au
WUTH: Dam good idea for future

YOU will never guess what has happened. Remember the Wyaralong Dam? It's Queensland's only dam built in the past 20 years, out Beaudesert way. No, not the ill-feted Traveston Dam up north, the one environment minister Peter Garrett actually had the...

Date Found: 10/01/2011 4:51 AM
Summary ID: 88289454
To view the web page: click here>>

Audience	
Unique Daily Visitors:	4,625
Av. Story Audience:	2,786
Advertising Space Rate	
AUD:	11,125

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

Sunshine Coast Daily - www.sunshinecoastdaily.com.au
Weather delays pipeline progress

Work on the Northern Pipeline Interconnector has been delayed due to inclement weather. Barry Leddicoat PROLONGED heavy rain has led to extensive delays in construction of the Northern Pipeline Interconnector stage 2 works on the Sunshine Coast.

Date Found: 9/01/2011 8:35 AM
Summary ID: 88242423
To view the web page: click here>>

Audience	
Unique Daily Visitors:	3,661
Av. Story Audience:	897
Advertising Space Rate	
AUD:	1,479

The Australian - www.theaustralian.com.au
12:53PM Time to lose dam phobia, Abbott urges

Image Video Video A A trapped kangaroo hops along the fenceline of Rockhampton's inundated airport. Picture: Lyndon Mechielsen Source: The Australian Baralaba Baralaba ndm.media.loadvcms.articleplayer("1724865282"); Flood battlers Rosanne Barrett...

Date Found: 7/01/2011 3:36 PM
Summary ID: 88101504
To view the web page: click here>>

Audience	
Unique Daily Visitors:	352,499
Av. Story Audience:	10,150
Advertising Space Rate	
AUD:	24,903

The Australian - www.theaustralian.com.au
Gillard challenges Abbott on dams

Video Video The Baralaba mine in Queensland is inundated by floodwaters flowing from the Dawson River. ndm.media.loadvcms.articleplayer("1724865282"); Flood battlers Rosanne Barrett discovers how a Rockhampton man and his mates kept the floodwaters at...

Date Found: 7/01/2011 4:56 PM
Summary ID: 88108609
To view the web page: click here>>

Audience	
Unique Daily Visitors:	352,499
Av. Story Audience:	10,150
Advertising Space Rate	
AUD:	27,962

Press

FED:Abbott's dam plan slammed
AAP Newswire, 08/01/11, National, Page 0
By: AAP

TONY ABBOTT'S proposal to build more dams to manage future floods and store water has been dismissed as simplistic by federal Labor .. environmentalists and researchers. Prime Minister JULIA GILLARD says a number of dams aren't the answer to floods like the one that's hit Queensland.

Article Information	
Item ID:	00088200316
Circulation:	0
Number of words:	104
Article type:	AAP Newswire
Photo:	No
Advertising Space Rate	
AUD:	0

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

TV shock! Benaud goes to water and utters the D-word in front of an open microphone

Australian, 10/01/11, Letters, Page 11
By: None

CUT & PASTE Putting water behind walls may have been acceptable in your day, Richie, but this is 2011 Richie Benaud in the Nine Network commentary box on Thursday: ALL that water in Queensland and NSW. There must be some way of harnessing all of that. Dams, perhaps, so you could use the water in times of drought.

Article Information

Item ID:	00088270430
Circulation:	131,246
Number of words:	651
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	3,928

Torrential rain raises alarm for southeast

Courier Mail, 10/01/11, Edition Changes - Late City, Page 2
By: Brian Williams Kathleen Donaghy

THE major highway north of Brisbane was cut last night and almost 3000 homes were left without power as Queensland's flood crisis moved to the southeast corner.

Article Information

Item ID:	00088281805
Circulation:	211,230
Number of words:	807
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	16,891

A dam complicated issue

Courier Mail, 10/01/11, Letters, Page 21
By: J. V. Hodgkinson

IAN Herbert (Letters, Jan 8), commenting on dams built on the Fitzroy River, has his arithmetic right. The capacity of any dam built on the Fitzroy would be insufficient to hold back or mitigate a flood similar to the one being experienced. A similar situation exists in southeast Queensland in the Brisbane River when considering the 1841, 1890, 1893 and 1974 floods.

Article Information

Item ID:	00088272055
Circulation:	211,230
Number of words:	415
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	2,129

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

Torrential rain raises alarm for southeast

Courier Mail, 10/01/11, General News, Page 2
By: Brian Williams Kathleen Donaghy

QUEENSLAND'S flood focus has turned to the southeast, with Maryborough, Gympie, Wide Bay, Kingaroy and Cooloola in flood and Brisbane in the firing line. As the clean-up begins in central Queensland and the west, the situation is expected to worsen today with torrential rain in the already soaked Burnett, Wide Bay and southeast coast.

Article Information

Item ID:	00088272714
Circulation:	211,230
Number of words:	815
Article type:	News Item
Photo:	Yes

Advertising Space Rate

AUD:	16,400

Southeast to expect a flash-flood summer

Courier Mail, 08/01/11, General News, Page 3
By: Brian Williams Sophie Elsworth

BRISBANE and the southeast face a summer of flash floods, with insurers and local government warning of potentially heavy costs to homeowners and businesses. Weather bureau flood maps show almost every creek and catchment from far north Queensland to northern NSW is sodden, and heavy rain and storms are predicted for the southeast coast and Wide Bay and Burnett districts into next week.

Article Information

Item ID:	00088128812
Circulation:	211,230
Number of words:	396
Article type:	News Item
Photo:	Yes

Advertising Space Rate

AUD:	6,277

Recovery chief heads straight for frontline

Courier Mail, 08/01/11, General News, Page 2
By: Peter Michael

A big job that needs to be done properly THE man charged with leading the rebuilding of flood-ravaged Queensland has conceded it will take years for some regions to fully recover.

Article Information

Item ID:	00088128816
Circulation:	211,230
Number of words:	829
Article type:	News Item
Photo:	Yes

Advertising Space Rate

AUD:	15,441

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

What's hot

Courier Mail, 08/01/11, Letters, Page 55
By: None

Sydney Lawrence of Manly I think the dam plans of Opposition Leader Tony Abbott would be truly nation-building and far more value for money than the Government's National Broadband Network. Sapper of GC Now is the time to build when we have ample storage. Don't decide to build when we are in drought again.

Article Information

Item ID:	00088127868
Circulation:	211,230
Number of words:	211
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	1,758

Flood warnings as rain keeps falling

Gympie Times, 08/01/11, General News, Page 3
By: None

FLOOD waters were set to rise into Gympie's CBD parkland this morning, with "at least moderate floods." Gympie river height was 1O.29m at 405pm and rising at all measuring locations upstream.

Article Information

Item ID:	00088162712
Circulation:	5,630
Number of words:	130
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	2,785

Truth is the first casualty of politics

Morning Bulletin, 08/01/11, Letters, Page 34
By: Keith Whelan

ROBERT Schwarten (TMB 27/12), has actually made a very good point when he points out that I have never put my hand up to stand as a political representative in Queensland. Robert, this is because I believe in truth as the only way forward.

Article Information

Item ID:	00088157120
Circulation:	18,036
Number of words:	349
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	572

Rain easing by midweek

Queensland Times, 10/01/11, General News, Page 4
By: None

BUREAU of Meteorology (BOM) forecasters predict possible thunderstorms today and tomorrow with rain likely to stay with Ipswich until next weekend. Rain periods are predicted today with rain easing to a few showers on Wednesday and a shower or two for both Thursday and Friday.

Article Information

Item ID:	00088276122
Circulation:	10,512
Number of words:	77
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	175

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

All gates opened at Wivenhoe

Queensland Times, 10/01/11, General News, Page 4
By: None

ALL five Wivenhoe Dam gates were opened at the weekend, with releases into the Brisbane River set to continue over the next couple of days. Releases at the dam started on Thursday night but heavy rainfall across the region led to all five gates being opened on Saturday.

Article Information

Item ID:	00088276123
Circulation:	10,512
Number of words:	175
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	355

Flood gates open as more rain forecast

Queensland Times, 10/01/11, General News, Page 1
By: Zane Jackson

RAIN, rain and more rain it's a forecast that would have been welcomed with open arms a few years ago, but one the Ipswich region could now do without. All five gates at the Wivenhoe Dam are open, Colleges Crossing and other roads remain closed and The Bureau of Meteorology is predicting rain to last until the coming weekend.

Article Information

Item ID:	00088276132
Circulation:	10,512
Number of words:	704
Article type:	News Item
Photo:	Yes

Advertising Space Rate

AUD:	7,720

Floods inconvenience all

Queensland Times, 10/01/11, Letters, Page 9
By: None

AS a resident of Mount Crosby for 17 years, I have experienced the inconvenience of Colleges Crossing being closed due to water release from Wivenhoe Dam and flooding rains. However, to put this in perspective, the closure of Colleges Crossing has occurred less than once every two years, on average, during the past 17 years.

Article Information

Item ID:	00088276394
Circulation:	10,512
Number of words:	163
Article type:	Letter
Photo:	Yes

Advertising Space Rate

AUD:	567

Rain forces dam water releases

Queensland Times, 08/01/11, General News, Page 6
By: None

HEAVY rain in the Ipswich region has forced water grid managers to make water releases from the Somerset and Wivenhoe Dams. One gate was opened at Wivenhoe yesterday, with officials expecting releases to continue over the weekend.

Article Information

Item ID:	00088178117
Circulation:	10,512
Number of words:	195
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	366

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

High volume of traffic too much for bridge

Queensland Times, 08/01/11, General News, Page 6
By: Yvonne Gardiner Ygardi Ner@Qtcom Au

THE ramshackle detour that drivers are forced to take along Allawah Road at Chuwar when Colleges Crossing is under water is clearly unsafe for the high volume of traffic it now carries. This part-dirt, potholed road includes the one-lane Mt Crosby Weir bridge.

Article Information

Item ID:	00088178123
Circulation:	10,512
Number of words:	277
Article type:	News Item
Photo:	Yes

Advertising Space Rate

AUD:	696

Water supply's fiery test

Queensland Times, 08/01/11, General News, Page 18
By: Beryl Johnson

TENDERS were called in June 1876 to contract for work in connection with the Ipswich Water Supply, consisting of service reservoir, well, tunnel and breastwork at the pumping station.

Article Information

Item ID:	00088178648
Circulation:	10,512
Number of words:	688
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	1,843

Drivers frustrated as crossing closes again

Queensland Times, 08/01/11, General News, Page 6
By: Zane Jackson

IN what is becoming a recurring headache for many Ipswich residents, Colleges Crossing closed again yesterday due to increased rain and dam releases. An Ipswich City Council spokesperson said it was the sixth time the Mt Crosby Road crossing over the Brisbane River had been closed since October last year.

Article Information

Item ID:	00088178128
Circulation:	10,512
Number of words:	318
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	1,638

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

Shaken funds look to retail sector

Summaries - Australian Financial Review, 10/01/11, Property, Page 40
By: Michael Hobbs

Capital is being raised by many unlisted property funds via the retail investor market. According to Louis Christopher of Adviser Edge, "Some groups have looked at the [elevated capitalisation] rates of unlisted property and think it could be a good opportunity especially if the economy continues to recover." Investor groups include Century Funds Management, Real Estate Capital Partners, Charter Hall Group and GDI Property Group. Century is expected to raise funds via a trust including Medtronic House purchased from Valad Property Group - a building occupied by Link Water, Opus Qantec McWilliam. Real Estate Capital Partners' Property Trust 3 unit holders will need to decide what is to be done with the unlisted entity, as debts are owed to Royal Bank of Scotland (one option is to sell the asset Sydney Opera House Car Park, another is to refinance and raise capital of $40 million potentially).

Article Information

Item ID:	00088282143
Circulation:	77,046
Number of words:	142
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	0

Hypocrisy on dam plan: Gillard

Summaries - Australian Financial Review, 08/01/11, General News, Page 7
By: John Kerin

The Federal Opposition's new water and food security platform has been ridiculed by Prime Minister Julia Gillard, who suggested that past failures in creating dams were largely the doing of the Coalition and its state allies. Andrew Robb, shadow finance minister, will head Tony Abbott's taskforce dedicated to the investigation of new dam locations. Speaking to Sky News, Queensland Premier Anna Bligh, in the midst of flood relief duties, requested that the Coalition refrain from such debate and focus on helping relief. Bob Brown of the Federal Greens said dams would increase flood risks while doing all sorts of environmental damage to forests, farmland, wetlands and fisheries. Anthony Albanese, Federal Infrastructure Minister, stuck to Gillard's line, suggesting that the Coalition caused the failure of the Traveston Dam. Peter Garrett dismissed that plan in 2010. Kristina Keneally, NSW Premier, recently abandoned the Tillegra Dam in the Hunter Valley. Across the nation, desalination plants have been pursued in the name of water security, for greater cost but lesser controversy than a comparable dam.

Article Information

Item ID:	00088161005
Circulation:	77,046
Number of words:	171
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	0

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

Few affectations

Sunday Mail Brisbane, 09/01/11, Event, Page 24
By: Damien Anthony Rossi

IT HAS certainly been the wet summer forecasters were pre-dicting as Ten News reporter Summer Burke discovered when she received an on-air drenching. Burke who, on January 29, starts as weather presenter for Channel 10's new Queensland weekend bulletin was reporting live from Wivenhoe Dam and, due to spray coming off the spillway, got completely soaked.

Article Information

Item ID:	00088132112
Circulation:	525,477
Number of words:	390
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	20,796

RS I, Yet another shuffle is on the cards

Sunshine Coast Daily, 08/01/11, General News, Page 33
By: None

The official weather forecast for Rockhampton on Thursday was accurate enough, in an understated, Australian way. Showers and a possible thunderstorm or two. Just enough to keep about one million square kilometres of Queensland under water.

Article Information

Item ID:	00088153017
Circulation:	20,603
Number of words:	876
Article type:	News Item
Photo:	Yes

Advertising Space Rate

AUD:	7,102

Are you prepared for summer storms?

Sunshine Coast Daily, 08/01/11, Real Estate, Page 4
By: Michele Sternberg

THE rumble of thunder rolls through the muggy atmosphere. Lightning cracks and rain drops the size of a 10 cent piece begin to fall, leaving wet splats on the concrete. One by one they fall and then the clouds open.

Article Information

Item ID:	00088037015
Circulation:	20,603
Number of words:	763
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	8,631

Pipeline progress delayed by weather

Sunshine Coast Sunday, 09/01/11, General News, Page 3
By: None

PROLONGED heavy rain has led to extensive delays in construction of the Northern Pipeline Interconnector stage 2 works on the Sunshine Coast. Acting Minister for Infrastructure and Planning Desley Boyle said the bad weather had created safety and environmental concerns, meaning a three-week delay to major works was unavoidable.

Article Information

Item ID:	00088227161
Circulation:	36,000
Number of words:	248
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	399

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

Hundreds visit dams

Toowoomba Chronicle, 10/01/11, General News, Page 1
By: None

THE rainy weekend didn't stop hundreds of people visiting Perseverance Dam to see water flowing over the spillway after the dam reached 100 per cent capacity on Friday afternoon. Perseverance Dam has not reached spill point for 10 years.

Article Information

Item ID:	00088280429
Circulation:	22,644
Number of words:	257
Article type:	News Item
Photo:	Yes

Advertising Space Rate

AUD:	1,974

Pipeline makes us drought-proof

Toowoomba Chronicle, 10/01/11, Letters, Page 19
By: None

I'M sure former mayor of Toowoomba Di Thorley would be proud to hear that Toowoomba's comhiued dam water storage is uow two-thirds full. Only a year ago we were looking at recycling our water.

Article Information

Item ID:	00088282156
Circulation:	22,644
Number of words:	70
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	157

Dams hit spill points

Toowoomba Chronicle, 08/01/11, General News, Page 7
By: None

PERSEVERANCE Dam reached full capacity yesterday afternoon, as water flowed over the spillway for the first time in almost 10 years. Significant rainfall yesterday pushed the level from 97 per cent

Article Information

Item ID:	00088142307
Circulation:	22,644
Number of words:	251
Article type:	News Item
Photo:	Yes

Advertising Space Rate

AUD:	1,879

Cooby Dam Wall closed

Toowoomba Chronicle, 08/01/11, General News, Page 6
By: None

Due to high levels of algal toxins present in raw water samples, council's day use area at Cooby Dam Wall is closed to public access until further notice. The closure is necessary as raw (untreated) water is supplied to all taps and toilet facilities at this location.

Article Information

Item ID:	00088141465
Circulation:	22,644
Number of words:	109
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	172

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

PM buckets Abbott's dam plan

Weekend Australian, 08/01/11, General News, Page 5
By: Sid Maher

JULIA Gillard has dismissed Tony Abbott's taskforce to examine building more dams as a "plan for a committee" from a Coalition that had campaigned against new dams in Queensland and NSW in recent years. Calling for national leadership and vision on water policy, the opposition Leader yesterday announced that the Coalition's finance spokesman,

Article Information

Item ID:	00088126585
Circulation:	300,941
Number of words:	507
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	7,733

Chat room

Weekend Gold Coast Bulletin, 08/01/11, Letters, Page 44
By: None

NOW in hindsight Anna Bligh, dont you just wish you had spent our money on building dams. Allconnex must be rubbing their hands together, everyone will need water to wash out their homes. When can we have some pollies with brains. Freddie GOOD on the guy who filmed the idiots in the jeep, but mate you were driving and filming at the same time, just as bad.

Article Information

Item ID:	00088138522
Circulation:	39,593
Number of words:	1382
Article type:	News Item
Photo:	No

Advertising Space Rate

AUD:	2,797

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

TV

Channel 7 (Brisbane)
Seven News (Weekend) - 9/01/2011 6:00 PM
Sharyn Ghidella
Chief of Staff Mr Warren Evans 07 3368 7363

Audience	
Male 16+:	56,000
Female 16+:	70,000
All People:	134,000
Advertising Space Rate	
AUD:	21,295

Qld's flood disaster is now threatening inundation in the Southern corner of the state. Four kayakers were washed away by raging waters at Woodford, and another car was nearly washed off the road. Warren Bridson, Qld Emergency Management warns residents to prepare for flooding. Wivenhoe Dam's five gates are already open.

Interviewees: Jason Renwick, Woodford Police; Warren Bridson, Qld Emergency Management
Duration: 2.54
Summary ID: S00042026197
This program or part thereof is syndicated to the following 12 station(s):- Prime Gold Coast (Gold Coast), Seven Bundaberg (Bundaberg), Seven Cairns (Cairns), Seven Central (Alice Springs), Seven Mackay (Mackay), Seven Mt Isa (Mt Isa), Seven Rockhampton (Rockhampton), Seven Sunshine Coast (Sunshine Coast), Seven Toowoomba (Toowoomba), Seven Townsville (Townsville), Southern Cross Central (Alice Springs), Southern Cross Darwin (Darwin)
© Media Monitors

Channel 7 (Brisbane)
Seven News - 7/01/2011 6:08 PM
Newsreaders
Chief of Staff Mr Warren Evans 07 3368 7363

Audience	
Male 16+:	23,000
Female 16+:	43,000
All People:	72,000
Advertising Space Rate	
AUD:	7,694

There has been heavy rain in SE Qld, leading to saturated land and a higher flash-flooding risk. There is amateur footage of flash flooding in the Toowoomba Ranges. Lockyer mayor Steve Jones said there are great losses in many areas. There were over 100mm in rain over 24h in parts of Brisbane. Warren Bridson from Emergency Management Qld said there 350 SES jobs in SES Qld. Toowoomba mayor Peter Taylor said the dams are full for the first time since 1991. Dan Spiller from SEQ Water Grid explained the weather events in the area.

Interviewees: Dan Spiller, SEQ Water Grid; Peter Taylor, Mayor, Toowoomba; Steve Jones, Mayor, Lockyer; Warren Bridson, Emergency Management QLD
Duration: 1.57
Summary ID: S00042018003
This program or part thereof is syndicated to the following 9 station(s):- Seven Bundaberg (Bundaberg), Seven Cairns (Cairns), Seven Central (Alice Springs), Seven Mackay (Mackay), Seven Mt Isa (Mt Isa), Seven Rockhampton (Rockhampton), Seven Sunshine Coast (Sunshine Coast), Seven Toowoomba (Toowoomba), Seven Townsville (Townsville)
© Media Monitors

COPYRIGHT This report and its contents are for the use of Media Monitors' subscribers only and may not be provided to any third party for any purpose whatsoever without the express written permission of Media Monitors Pty Ltd.

DISCLAIMER The material contained in this report is for general information purposes only. Any figures in this report are an estimation and should not be taken as definitive statistics. Subscribers should refer to the original article before making any financial decisions or forming any opinions. Media Monitors makes no representations and, to the extent permitted by law, excludes all warranties in relation to the information contained in the report and is not liable to you or to any third party for any losses, costs or expenses, resulting from any use or misuse of the report.

MEDIA MONITORS

MEDIA MONITORS

AAP Newswire
08-Jan-2011
National
Market: Australia
Market: Australia
MTWTFSS

back

FED:Abbott's dam plan slammed

TONY ABBOTT'S proposal to build more dams to manage future floods and store water has been dismissed as simplistic by federal Labor .. environmentalists and researchers.

Prime Minister JULIA GILLARD says a number of dams aren't the answer to floods like the one that's hit Queensland.

But the opposition leader argues after the 1974 floods in Brisbane .. the Wivenhoe dam was built and there have been no serious floods in Brisbane or the Brisbane Valley since.

The coalition is setting up a taskforce in its own ranks to develop a plan for dam building .. chaired by opposition finance spokesman ANDREW ROBB.

AAP RTV jcd/wz/sw

Content Supplied by Australian Associated Press
© AAP, All Rights Reserved. See disclaimer at http://aap.com.au/disclaimer.asp

MEDIA MONITORS

back



Australian
10-Jan-2011
Page: 11
Letters
Market: Australia
Circulation: 131246
Type: Australian National
Size: 233.59 sq.cms
MTWTF

TV shock! Benaud goes to water and utters the D-word in front of an open microphone

CUT & PASTE

Putting water behind walls may have been acceptable in your day, Richie, but this is 2011

Richie Benaud in the Nine Network commentary box on Thursday:
ALL that water in Queensland and NSW. There must be some way of harnessing all of that. Dams, perhaps, so you could use the water in times of drought.

Greens press release September 6, 2008:
GREENS leader Bob Brown has called on environment minister Peter Garrett to stop the proposed Traveston Dam across the Mary River near Gympie in Queensland. Speaking to hundreds of farmers and local residents gathered at the proposed dam site this morning, Senator Brown said the dam should be opposed because it would flood thousands of hectares of prime food-producing land close to Brisbane, Aboriginal heritage sites and the main nursery for the world famous Australian lungfish. "I've told the minister there is no way he should allow the major breeding ground for the Australian lungfish or the Mary River turtle or Mary River cod to be obliterated."

Wash your mouth out. Tony Abbott on Radio 4BC on Friday:
FOR too long in this country we have had this dam phobia. I think this is one of the regrettable impacts of the green movement, this assumption that you can never build another dam. Well, I fail to see that there is not any single site left anywhere in Australia where a dam's economic and social benefits are outweighed by the environmental costs.

You had to be there. Bob Brown in *The Australian*, October 9, 2007:
WHEN Bob Hawke stood in front of 15,000 people in Melbourne, and Hazel put triangular "No dam" earrings on, it was electrifying.

Back in Benaud's day ... News agency report, December 2, 2007:
REMAINS of an ancient dam dating back some 4000 years have been discovered in Upper Egypt... The Egyptian archeology supremo stressed the importance of the finding, saying it proved that the ancient Egyptians were good at building dams.

The history of perks. Ian Cameron, member for Maranoa, September 12, 1984:
I NOTE that Telecom is to make it much easier for mobile telephones to be used. I believe that every member of parliament ought to have a mobile telephone. I think it would be of tremendous assistance. I am the only person in parliament who has a high frequency radio in my car. ... I can ring anybody in Australia or, if need be, around the world, although I like to confine myself to Australia and preferably to the electorate of Maranoa. The mobile telephone is a very useful tool. As the minister knows, we are very busy people. We waste a lot of time sitting in motor cars when I believe we could be using a telephone and getting on with our business.

Nine Network online chat with Gerry Harvey, February 15, 2000:
INTO the future mobile phones will connect to the internet, you will be able to chat on them, with a little screen so that you can see the person you are chatting to, you will be able to email and it will be used as a remote control to take care of your house for all your appliances and your security. It will be able to do an awful lot of the functions computers do now.

Addressing the halal KFC bacon brouhaha turned viral video, Josh Grech gives *The Daily Telegraph* a surprise bleeding heart on Saturday:
THE question is: why film the outburst and what were you hoping to achieve by sharing it with the world? Sure, make an official complaint. Get the guy fired for his ridiculous behaviour, if you will. But posting a video of half a fracas only feeds the fire that this young man and others like him use to justify their actions — regardless of who they are or what tenet or menu they subscribe to.

***The Sydney Morning Herald* sub-editors thoughtfully warn off readers with this headline on Elizabeth Farrelly's column on January 6:**
OH no, random thoughts pop into my holiday head.

cutpaste@theaustralian.com.au

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Courier Mail
10-Jan-2011
Page: 2
Edition Changes - Late City
Market: Brisbane
Circulation: 211230
Type: Capital City Daily
Size: 1037.17 sq.cms
MTWTFS-

Torrential rain raises alarm for southeast

Brian Williams
Kathleen Donaghy

THE major highway north of Brisbane was cut last night and almost 3000 homes were left without power as Queensland's flood crisis moved to the southeast corner.

As the clean-up continues in central Queensland and the west, up to 90mm of rain fell in the state's capital city yesterday, with some parts of the Sunshine Coast sopping up more than 200mm in 24 hours.

Police were forced to close the Bruce Highway near Elimbah, north of Caboolture, when the King John Creek flooded north and southbound lanes about 10 o'clock last night.

Earlier in the day, police closed both lanes of the highway because of flooding at Kybong, 10km south of Gympie, and it had not reopened late last night.

Further north, authorities declared the Bruce Highway north of Gladstone a danger zone, and both lanes remain cut off by flooding surrounding Rockhampton.

Late last night 2844 homes across Brisbane's east and bay areas, Brisbane Valley, Caboolture, Redcliffe, Gympie and Mary Valley, the Ipswich area and the Sunshine Coast remained without power.

Energex said 10,000 homes were affected earlier in the day amid 5000 lightning strikes.

Although the southeast faces rain today and tomorrow, conditions will ease to showers on Wednesday, with a welcome forecast for mostly sunny conditions next weekend.

The first glimmer of sunshine is not expected until Saturday.

Emergency Management Queensland acting assistant director-general Warren Bridson warned residents in low-lying areas of affected towns to prepare immediately by securing personal belongings and planning an escape route.

About 116,000 megalitres of water a day is being released from the Wivenhoe Dam flood compartment. Releases may impact upon Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing for several days. Local councils have details on road closures.

Substantial releases have been made from Leslie Harrison Dam at Redland City, east of Brisbane, and minor releases from Hinze Dam on the Gold Coast.

Mr Bridson warned that people should be aware that 100mm to 200mm of rain on saturated catchments had a dramatically different effect in terms of rapid flooding compared with the same amount of rainfall during dry periods.

He said residents were not so much complacent but rather failed to understand how rapidly streams could rise.

Police Chief Superintendent Alistair Dawson said the statewide floods were now so large and had hit so many districts that it had reached the stage where there was hardly a person in Queensland who did not know someone who had been impacted personally.

"It's an amazing situation," Supt Dawson said. "We've got water police stationed in St George. Who would have thought that?

"We've got swift water rescue crews stationed in Dirranbandi and there are Navy Sea King helicopters at Roma and an (aviation) fuel dump at St George."

Supt Dawson warned that with some residents in the Sunshine Coast hinterland areas of Kilcoy and Woolooga in fear of their lives because of fast-rising water over the weekend, it was important people had plans in place about what to do should their area flood.

"People need to think about

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back

Courier Mail
10-Jan-2011
Page: 2
Edition Changes - Late City
Market: Brisbane
Circulation: 211230
Type: Capital City Daily
Size: 1037.17 sq.cms
MTWTFS-

how to get out," he said. "And if you don't need to travel, stay off the roads."

Mr Bridson said many roads had become deadly to cross and appealed to drivers to think about the consequences of their actions and the risk to the lives of others.

More than 200,000 people and more than 10,700 properties have been affected in the Christmas-New Year floods.

The repair bill stands at $5 billion for the deluge that has seen water sweep through an area the size of France and Germany combined.

At St George in the southwest, floods peaked yesterday about the same height as last year's record flood, easing fears of a major inundation.

Four houses had water damage, a further four were surrounded by floods and about 20 yards inundated. A total of 35 residents had moved out to higher ground.

Supt Dawson said Gympie had 20 businesses affected by floodwaters but no homes.

In Maryborough, three homes and three businesses had been inundated.

In Rockhampton, 158 people remained evacuated and 400 homes and 150 businesses were still affected by flooding in some way.

A large number of people were helping with the Condamine clean-up but the hamlet is not yet safe, with the Condamine River set to submerge the town bridge again last night.

Towards the border, water was rising at Dirranbandi but the town was dry and safe, while at Emerald the clean-up had begun amid serious accommodation issues.

RAIN AND FINALLY SHINE

RAINFALL IN THE 24 HOURS TO 7PM

Maleny	West Bellthorpe	Peachester
296mm	286mm	264mm

OUTLOOK

Brisbane/Gold Coast/Sunshine Coast

TODAY	WEDNESDAY TO FRIDAY	SATURDAY
Rain periods, possible thunder	Showers	Mostly fine, possible shower

Southeast coast district/southern parts of the Wide Bay and Burnett district/northeastern parts of the Darling Downs and Granite Belt districts:

TODAY-TOMORROW Rain and thunderstorms

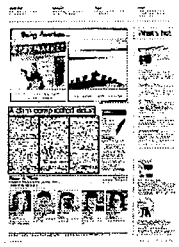
WEDNESDAY TO THURSDAY: Isolated showers



Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Courier Mail
10-Jan-2011
Page: 21
Letters
Market: Brisbane
Circulation: 211230
Type: Capital City Daily
Size: 130.73 sq.cms
MTWTFS-

A dam complicated issue

IAN Herbert (Letters, Jan 8), commenting on dams built on the Fitzroy River, has his arithmetic right. The capacity of any dam built on the Fitzroy would be insufficient to hold back or mitigate a flood similar to the one being experienced.

A similar situation exists in southeast Queensland in the Brisbane River when considering the 1841, 1890, 1893 and 1974 floods.

The Wivenhoe dam and the Somerset would take off some of the height in a flood but are in the main useless against these types of very large floods.

For example the smaller 1974 flood, if it had occurred at the moment when these two dams are full, would overflow the Wivenhoe by a volume of water more than three times its capacity.

If a repeat of the 1893 flood occurred the overflow would be double the volume held by the Wivenhoe. This is based on official pre-development flows calculated by the Government – with no dams or people.

Instead, spare capacity can be increased by raising the nearby Borumba Dam to contain two million megalitres. This would more than double the capacity of the Wivenhoe/Somerset system.

When dam levels are high, pumping could be carried out to create spare capacity in the Wivenhoe/Somerset system.

Currently, a volume of water equivalent to 60 per cent of the Wivenhoe capacity has flowed over its spillway. More than half of it could have been saved.

Billions of dollars could also be saved in capital and running costs and could replace current and future desalination and recycling initiatives.

J. V. Hodgkinson, Holland Park

J.G.F. Collins (Letters, Jan 7) asks why our leaders have not had the will to build dams in previous years to store water and to prevent flooding. How soon we forget.

Our State Government spent millions of dollars and put a lot of effort into trying to get a dam at Traveston Crossing, only to have been prevented from doing so by the "not in my backyard" brigade and the green lobby.

For all of its faults, the Government was at least on this occasion trying to put the best interests of the community first.

I, for one, can understand their reluctance to try to build any more dams. They can't win.

Darren Bowles, Birkdale

HAVE any of our politicians been checking out possible sites for dams to help ease future flooding? No, they are too busy with photo opportunities and big-noting themselves.

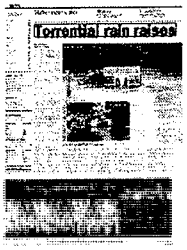
Today's politicians can be considered "reactionaries" as all they do is react to situations.

Colin Dicker, Bracken Ridge

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Courier Mail
10-Jan-2011
Page: 2
General News
Market: Brisbane
Circulation: 211230
Type: Capital City Daily
Size: 1006.99 sq.cms
MTWTFS-

Torrential rain raises alarm for southeast

Brian Williams
Kathleen Donaghy

QUEENSLAND'S flood focus has turned to the southeast, with Maryborough, Gympie, Wide Bay, Kingaroy and Cooloola in flood and Brisbane in the firing line.

As the clean-up begins in central Queensland and the west, the situation is expected to worsen today with torrential rain in the already soaked Burnett, Wide Bay and southeast coast.

The Sunshine Coast hinterland town of Maleny received more than 200mm of rain in the 24 hours to 5pm yesterday with some parts of Brisbane expected to receive up to 200mm today.

Showers are likely to persist in the southeast this week with a glimmer of sunshine on Saturday.

However, Emergency Management Queensland acting assistant director-general Warren Bridson warned residents in low-lying areas of affected towns to prepare immediately by securing personal belongings and plan an escape route.

At St George in the southwest, water levels peaked yesterday about the same height as last year's record flood, easing fears of a major inundation.

Gympie was preparing to be cut in half by rising waters and the Bruce Hwy blocked after more than 200mm of rain fell in the Mary River catchment yesterday.

Acting Mayor Tony Perrett said emergency services were being mobilised on both sides of the city in preparation for a possible peak of more than 17m. About 20 businesses were affected by flooding but no homes.

"We're prepared but we don't know where it might end up because it's still raining heavily," Cr Perrett said.

"There's been a lot of rain in Kenilworth and that will be heading our way."

In Maryborough, Fraser Coast Council Mayor Mick Kruger said up to 20 homes and 20 businesses could be affected by the predicted 9m peak.

Cr Kruger said the council had begun ferrying food and supplies to the suburb of Granville, which was isolated and all its shops empty. Forty visiting adults and children were being given shelter in the Granville community hall.

At Rockhampton, 158 people remained evacuated from their homes while 400 houses and 150 businesses were still affected by flooding.

At St George, four houses had water damage, another four were surrounded by floods and about 20 yards inundated. Thirty-five residents had moved to higher ground.

Police spokesman Chief Superintendent Alistair Dawson said the statewide floods were now so large and had hit so many districts that it had reached the stage where there was hardly a person in Queensland that did not know someone who had been impacted personally.

"It's an amazing situation," Supt Dawson said.

"We've got water police stationed in St George. Who would have thought that?

"We've got swift water rescue crews in Dirranbandi and there are Navy Sea King helicopters at Roma and an (aviation) fuel dump at St George."

Supt Dawson warned residents to plan what they would do if their area was flooded.

"People need to think about how to get out," he said. "And if you don't need to travel, stay off the roads."

Mr Bridson said many roads had become deadly to cross and appealed to drivers to think about the consequences of their actions and the potential risk to the lives of others.

A 12th person was killed on Saturday after jumping into a flooded creek in Cherbourg.

A large number of people were helping with the Condamine clean-up but the hamlet is on the verge of another flood. Last night, the Condamine River was set to submerge the town bridge again.

Towards the border, water was rising at Dirranbandi but the town was dry and safe, while at Emerald the clean-up had begun amid serious accommodation issues.

Mr Bridson warned that people should be aware that 100mm to 200mm of rain on saturated catchments had a dramatically different effect, in terms of rapid flooding, than the same amount of rainfall during dry periods.

He said residents were not so much complacent as failing to understand just how rapidly streams could rise.

About 116,000ML of water a day is being released from Wivenhoe Dam and releases are expected to change at short notice.

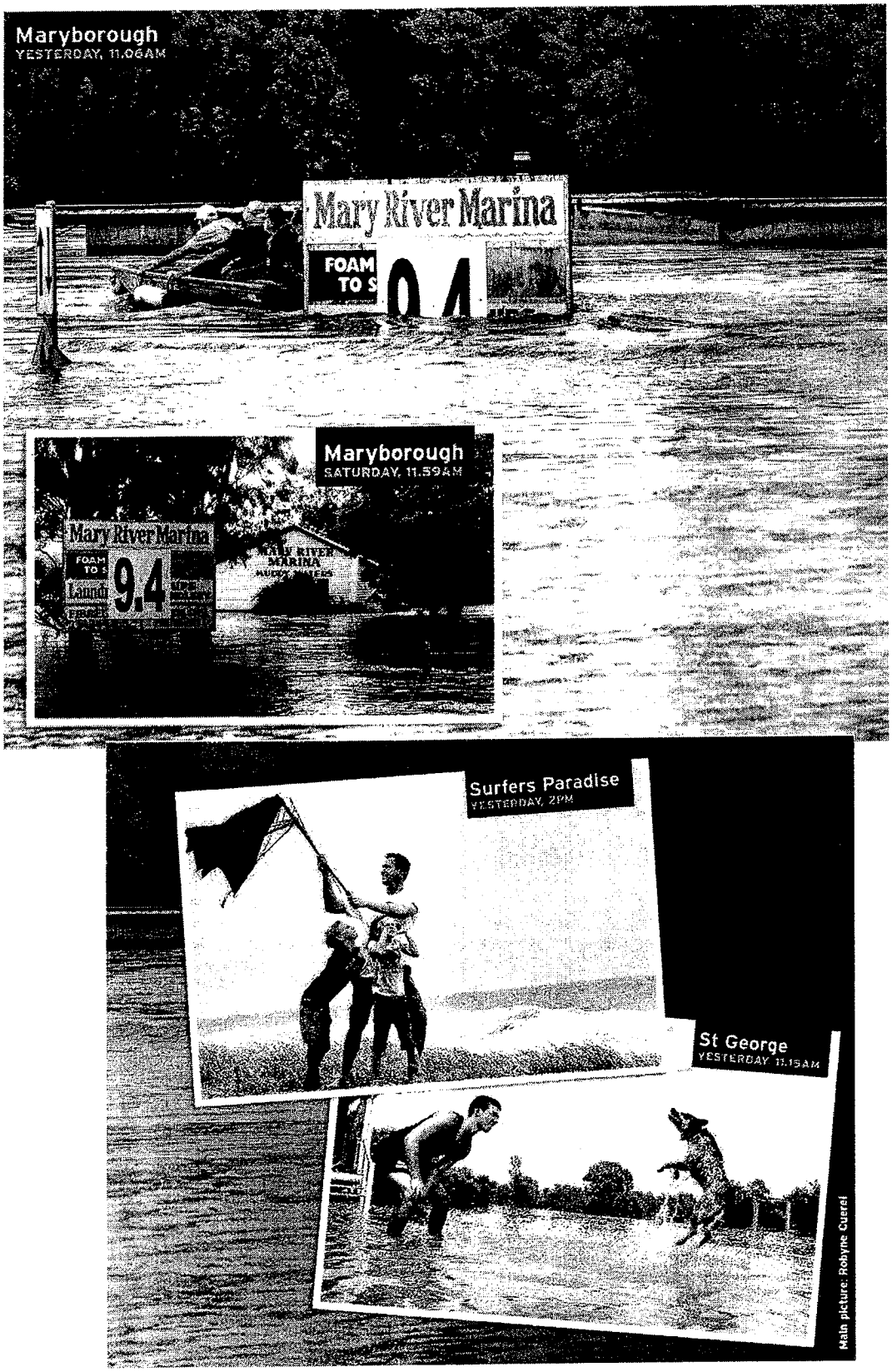
Dam releases may impact upon Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing for several days. Local councils have details on road closures.

Substantial releases have been made from Leslie Harrison Dam at Redland City, east of Brisbane, and minor releases from Hinze Dam on the Gold Coast.

Up until yesterday morning, the SES had taken 736 calls for help in 24 hours, with most of these from Cooloola, Maryborough, Hervey Bay, Rockhampton and Brisbane.

Copyright Agency Ltd (CAL) licenced copy.

Courier Mail
10-Jan-2011
Page: 2
General News
Market: Brisbane
Circulation: 211230
Type: Capital City Daily
Size: 1006.99 sq.cms
MTWTFS-



Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back

Courier Mail
10-Jan-2011
Page: 2
General News
Market: Brisbane
Circulation: 211230
Type: Capital City Daily
Size: 1006.99 sq.cms
MTWTFS-

RAIN AND FINALLY SHINE

RAINFALL IN THE 24 HOURS TO 7PM

Maleny	West Bellthorpe	Peachester
296mm	286mm	264mm

OUTLOOK

Brisbane/Gold Coast/Sunshine Coast

TODAY	WEDNESDAY TO FRIDAY	SATURDAY
Rain periods, possible thunder	Showers	Mostly fine, possible shower





Southeast coast district/southern parts of the Wide Bay and Burnett district/northeastern parts of the Darling Downs and Granite Belt districts:

TODAY-TOMORROW Rain and thunderstorms

WEDNESDAY TO THURSDAY: Isolated showers

State under water

Houses

167 remaining inundated with waters over floorboards

Evacuated

3762 registered, 1799 people currently out of their homes

Businesses

337 business affected, 20 in Gympie

SES help

736 calls in 24 hours to yesterday morning

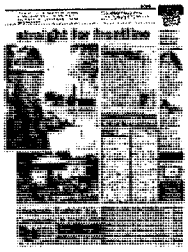
Wivenhoe

116,000 ML of water a day released

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Courier Mail
08-Jan-2011
Page: 3
General News
Market: Brisbane
Circulation: 211230
Type: Capital City Daily
Size: 385.44 sq.cms
MTWTFS-

Southeast to expect a flash-flood summer

Brian Williams
Sophie Elsworth

BRISBANE and the southeast face a summer of flash floods, with insurers and local government warning of potentially heavy costs to homeowners and businesses.

Weather bureau flood maps show almost every creek and catchment from far north Queensland to northern NSW is sodden, and heavy rain and storms are predicted for the southeast coast and Wide Bay and Burnett districts into next week.

Flash flooding and worsening river conditions are expected over a wide area.

It prompted insurers yesterday to warn that storms and intense local falls should not be taken lightly by a population whose focus was probably on the broader flood event across much of the state.

Wivenhoe Dam, upstream from Brisbane, will soon start releasing 130,000 megalitres a day.

This, combined with the strong local flows, will close Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing.

Bureau hydrologist Peter Baddiley said all Brisbane creeks had the potential for flash floods.

"What you get with these creeks is a quick response to rainfall," Mr Baddiley said. "They rise very quickly and fall very quickly.

"An old hydrologists' rule of thumb in Brisbane is that at 10mm (rain) an hour creeks will not cause too much trouble.

"But when you see intensities like 15 to 20mm an hour you expect to see rises. Then it depends exactly where you are as to how it affects you."

An example was at eastside Wynnum last week which recorded 90mm of rain in an hour, causing a minor local stream to burst its banks.

"All we can do is stay on watch and people should keep an eye out for council warnings," Mr Baddiley said.

National Climate Centre meteorologists predict wet conditions for the southeast until at least March, with the potential for more cyclones than usual.

It follows Queensland recording its wettest December and wettest spring on record.

Copyright Agency Ltd (CAL) licenced copy.

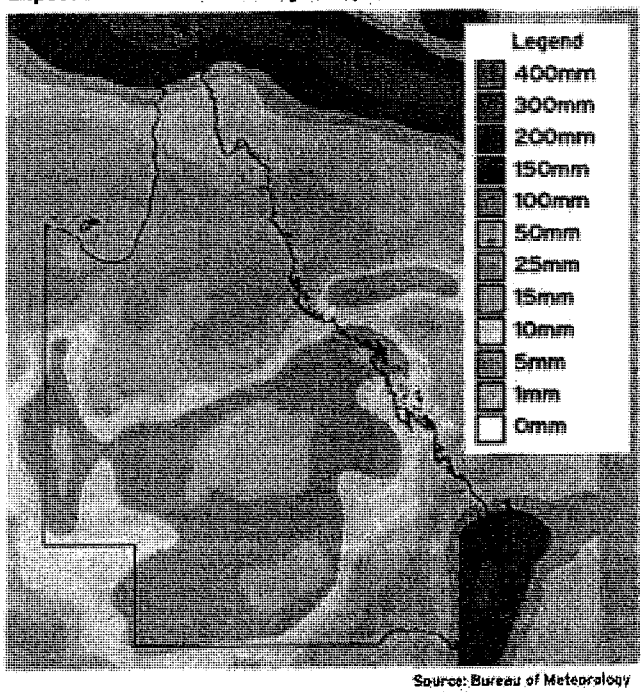
MEDIA MONITORS

back

Courier Mail
08-Jan-2011
Page: 3
General News
Market: Brisbane
Circulation: 211230
Type: Capital City Daily
Size: 385.44 sq.cms
MTWTFS-

LOOK WHAT'S COMING

Expected rain in the next eight days



Source: Bureau of Meteorology

To receive free notifications from the Creek Alert Flooding Service call Brisbane City Council on 3403 8888

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Courier Mail
08-Jan-2011
Page: 2
General News
Market: Brisbane
Circulation: 211230
Type: Capital City Daily
Size: 948.11 sq.cms
MTWTFS-

Recovery chief heads straight for frontline

A big job that needs to be done properly

Peter Michael
Jorga Orreal
Michael Madigan
Brian Williams

THE man charged with leading the rebuilding of flood-ravaged Queensland has conceded it will take years for some regions to fully recover.

But Major-General Mick Slater said the group tasked with a massive effort expected to cost more than $5 billion would not seek "short-term, temporary fixes". And he said the future was about the people, not the water.

"They are not victims," Maj-Gen Slater said on his first sortie into the flood-ravaged state yesterday.

"(They) are hard-working Australians who have been dealt a pretty horrible blow. And all they need, and all they want, is a hand to get back on their feet."

His visit came as:

• The Bligh Government extended joint State and Federal Government disaster relief and recovery arrangements to storm-hit southeast councils.

• The Insurance Council of Australia confirmed insurers had received about 4300 claims with a preliminary estimated cost of $150 million, which it said would increase.

• Condamine and Theodore residents finally returned to their homes to start the cleaning, and St George and Dalby prepared for renewed flooding over the next few days.

• A federal Opposition proposal for a series of dams to mitigate flooding was attacked as ill-conceived and in poor taste.

• A Townsville youth, 19, whose car was swept off a flooded road in central Queensland, was charged over the death of a passenger – one of 10 Queensland flood-related deaths. He allegedly tried to cross a flooded causeway about 67km north of Aramac on January 2.

Maj-Gen Slater, a father-of-three and decorated army veteran of Iraq, Timor and the Cyclone Larry effort, was visibly moved as he told of the mission ahead to rebuild the state's damaged heart.

"I'm a Queenslander," he said. "It's a big job that needs to be done. You'd be a stone-cold-hearted individual not to be touched emotionally. This is a tragedy."

He is today due to tour flood-affected St George, Condamine and Rockhampton with Prime Minister Julia Gillard and Premier Anna Bligh.

After flying into to Rockhampton, population 75,000, yesterday on his first day on the job, he described the state's flood-ravaged centre as like "a group of tropical islands".

"The volume of water out there is enormous," Maj-Gen Slater said, adding that there was "a hell of a lot of work to do" to get Rockhampton back on its feet.

The flood disaster chief met with the local disaster management group yesterday and said he wanted to get out and engage with the locals trying to cope with mud-filled homes, broken road and railway networks, and ruined crops, stock, mines and livelihoods.

"Short-term, temporary fixes won't work. We need to rebuild after this flood and I would like to see, and I'm sure we will see, parts of our infrastructure, parts of Queensland, that are better.

"We need to rebuild the infrastructure, we need to support the economy, we need to ensure that the large economic sectors in that part of the state get back on operational footing as quickly and as smoothly as possible – but we've got to get it right, we've got to get it right the first time."

Ms Gillard is due back in the flood zone today as the Federal Opposition ramps up pressure to increase funding to damaged communities. She is expected to visit Rockhampton.

The State Government yesterday made Brisbane City, Gympie, Ipswich City, Logan City, Croydon, Torres Shire and Redland City councils eligible for assistance to cover the cost of damaged public assets and disaster operations. A total of 49 of the 73 councils across the State are now covered.

Copyright Agency Ltd (CAL) licenced copy.

Courier Mail
08-Jan-2011
Page: 2
General News
Market: Brisbane
Circulation: 211230
Type: Capital City Daily
Size: 948.11 sq.cms
MTWTFS-

TOUR OF DUTY

YESTERDAY

0800 HOURS:
Left Brisbane for Rockhampton for first day on the job. Delayed in Brisbane for an hour due to thunderstorms.

1015 HOURS:
Landed in Black Hawk helicopter in Rockhamptor and describes the state's flood-ravaged centre as "like a lot of tropical islands".

1020 HOURS:
Met with Rockhampton Mayor Brad Carter and local disaster management group for briefing.

1040 HOURS:
Media conference with Australian and world's media including BBC, Al Jazeera and German television crews.

1110 HOURS:
Met with local businessman on the edge of hardest hit Depot Hill.

1130 HOURS:
Headed back to Brisbane to meet with state's other disaster chiefs.

TODAY

0915 HOURS:
Due to fly to St George with Prime Minister Julia Gillard and Premier Anna Bligh.

1115 HOURS:
Expected to visit flood-hit Condamine to meet with local authorities and residents.

1300 HOURS:
Due to fly into Rockhampton with Prime Minister.



Flood fightback

Wall of water

Hydrologists estimate the equivalent of seven olympic swimming pools of water is flowing through Rockhampton every second

'They are not victims. (They) are hard-working Australians who have been dealt a pretty horrible blow. And all they need, and all they want, is a hand to get back on their feet'
Major-General Mick Slater

130,000 megalitres

The amount of water Wivenhoe Dam, upstream from Brisbane, will soon start releasing each day

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back

Courier Mail
08-Jan-2011
Page: 2
General News
Market: Brisbane
Circulation: 211230
Type: Capital City Daily
Size: 948.11 sq.cms
MTWTFS-

DISASTER ZONE: The scene (right) that greeted Major-General Mick Slater (above) in Rockhampton yesterday, and (far right) Condamine residents begin the big clean-up.

Pictures: Jeff Camden, Glenn Hampson





Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

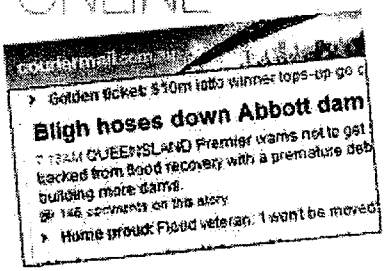
back



Courier Mail
08-Jan-2011
Page: 55
Letters
Market: Brisbane
Circulation: 211230
Type: Capital City Daily
Size: 107.92 sq.cms
MTWTFS-

What's hot

ONLINE



Sydney Lawrence of Manly
I think the dam plans of Opposition Leader Tony Abbott would be truly nation-building and far more value for money than the Government's National Broadband Network.

Sapper of GC
Now is the time to build when we have ample storage. Don't decide to build when we are in drought again.

Sue from Logan
Many governments in the past should have built more dams and directed water where it's needed. We need a water grid that goes around the country so that no one suffers.

Davo of North Queensland
Abbott's thought bubbles on dams have merit, but he needs to stop playing petty politics while we are in the middle of a crisis. Now is the time for national unity and support for our fellow Australians.

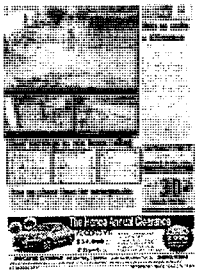
Dam Tony Abbott
It is kind of funny when you consider that Tony Abbott and the Coalition opposed the Traveston dam when much of Queensland was in drought and needed dams. Abbott was silent about building dams until Queensland was undergoing the worst floods in 70 years. Suddenly, dams are now the answer. This sounds like political opportunism from Abbott.

Alan of Logan
Premier Anna Bligh should stand up to the Greens and build some dams. We'd then have something to thank her for.

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Gympie Times
08-Jan-2011
Page: 3
General News
Market: Gympie QLD
Circulation: 5630
Type: Regional
Size: 845.37 sq.cms
-TWTFS-

Flood warnings as rain keeps falling

FLOOD waters were set to rise into Gympie's CBD parkland this morning, with "at least moderate floods."

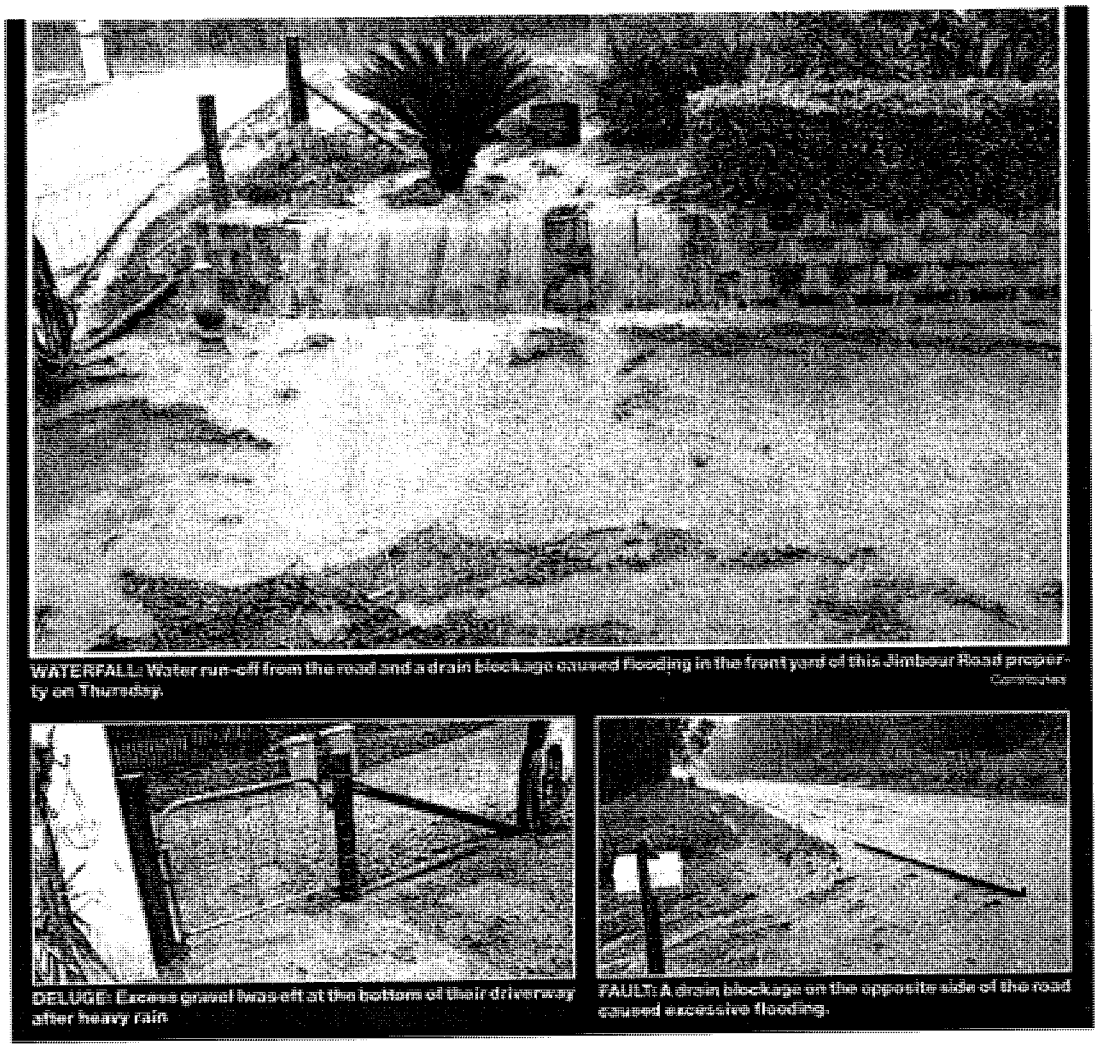
Gympie river height was 10.29m at 4.05pm and rising at all measuring locations upstream.

As rain continued to fall yesterday, the Borumba Dam was 1.03m over the spillway and rising flood levels were reported in critical Mary River tributaries, including Obi Obi, Bellbird, Kandanga, Amamoor, Six Mile, Deep, Glastonbury and Munna Creeks.

Rainfall Readings

For 24 hours to 9am yesterday

Maleny	38mm
Baroon Dam	40mm
Obi Lookout	43mm
Bellbird Creek	40mm
Kenilworth	50mm
Jimna	49mm
Kandanga	64mm
Cooroy	2mm
Pomona	70mm
Cooran	85mm
Fishermans Pocket	102mm
Woolooga	76mm
Miva	64mm
Goomboorian	69mm
Rainbow Beach	87mm
Double Island Point	14mm
Toolara	72mm
Wolvi	63mm
Widgee	40mm
Chatsworth	112.5mm
Amamoor	58mm
Tewantin	47mm
Moy Pocket	72mm



WATERFALL: Water run-off from the road and a drain blockage caused flooding in the front yard of this Jimbour Road property on Thursday.

DELUGE: Excess gravel has slid at the bottom of their driveway after heavy rain

FAULT: A drain blockage on the opposite side of the road caused excessive flooding.

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Morning Bulletin
08-Jan-2011
Page: 34
Letters
Market: Rockhampton QLD
Circulation: 18036
Type: Regional
Size: 112.86 sq.cms
MTWTFS-

Truth is the first casualty of politics

ROBERT Schwarten (TMB 27/12), has actually made a very good point when he points out that I have never put my hand up to stand as a political representative in Queensland.

Robert, this is because I believe in truth as the only way forward.

And, unfortunately, truth is the first casualty of the modern political scene. To return to your diatribe, denigrating my views on the political incompetence presently blighting Queensland, I would like to point out that in your own words the State Government borrowed money to fund the water grid in south-east Queensland. How is it possible that they used only monies collected from the taxpayers of that area to repay these loans? Granted these people are now weighed down with intolerable costs for their water and this money is used to pay for some of the costs, but the taxpayers of Queensland as a whole are now responsible for these debts! And, yes, the lack of adequate water was left to the last minute to address by successive Labor governments which led to a situation where it may have appeared to require massive infrastructure investment to correct the obvious failings of the aforementioned Labor governments.

But, Robert, stop and think about it for a moment, throwing money at a problem will not make the problem go away, and the problem here is that there are too many people being squeezed into that little area down there. There are not enough resources available, so you either have to take away the land of the country people for more dams or take away their money to fund hugely expensive and largely unnecessary projects. Remember the words of a real man of the people Robert, "you can fool some of the people some of the time, you can fool some of the people all of the time, but you can't fool all of the people all of the time". The people are catching on Robert. I have voted Labor all my life, but you have lost your way and this is one voter who will not be fooled again!

Keith Whelan,
Yeppoon

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Queensland Times
10-Jan-2011
Page: 4
General News
Market: Ipswich QLD
Circulation: 10512
Type: Regional
Size: 38.02 sq.cms
MTWTFS-

Rain easing by midweek

BUREAU of Meteorology (BOM) forecasters predict possible thunderstorms today and tomorrow with rain likely to stay with Ipswich until next weekend.

Rain periods are predicted today with rain easing to a few showers on Wednesday and a shower or two for both Thursday and Friday.

Saturday should mostly fine with a possible shower or two.

The BOM issued a flood warning yesterday for the Warrill Creek and Brisbane River below the Wivenhoe Dam, and said minor flooding should continue today.

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Queensland Times
10-Jan-2011
Page: 4
General News
Market: Ipswich QLD
Circulation: 10512
Type: Regional
Size: 77.07 sq.cms
MTWTFS-

All gates opened at Wivenhoe

ALL five Wivenhoe Dam gates were opened at the weekend, with releases into the Brisbane River set to continue over the next couple of days.

Releases at the dam started on Thursday night but heavy rainfall across the region led to all five gates being opened on Saturday.

An SEQ Water Grid statement said about 116,000 megalitres a day had been released, with operations liable to change at short notice depending on increased rainfall, inflows into the dam and river flows.

Water from Somerset Dam is also being released into Wivenhoe Dam through the sluice gates.

A spokesperson said Ipswich's Kholo Bridge and Colleges Crossing would be affected for several days at least.

The Spillway Lookout recreation area at Wivenhoe is still open, but anyone planning a trip there is advised there may be long delays due to the number of people visiting the site.

These releases are expected to continue until next week.

Due to water levels, Wivenhoe and Somerset is closed to all water-based recreational activities and it is expected to remain closed this week.

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Queensland Times
10-Jan-2011
Page: 1
General News
Market: Ipswich QLD
Circulation: 10512
Type: Regional
Size: 1674.13 sq.cms
MTWTFS-

STILL CUT OFF

No relief with six days of more rain: P4-5



NO-THROUGH ROAD: Oisin Duffy watches his children Lucas and Aedyn Duffy play in the calm waters at Colleges Crossing after the entire park was engulfed by water again yesterday due to releases from the Wivenhoe Dam.
Photo: Rob Williams IPS090111COLL10A

Copyright Agency Ltd (CAL) licenced copy.

Flood gates open as more rain forecast

Our monsoon continues and many roads remain closed

ZANE JACKSON
zane.jackson@qt.com.au

RAIN, rain and more rain – it's a forecast that would have been welcomed with open arms a few years ago, but one the Ipswich region could now do without.

All five gates at the Wivenhoe Dam are open, Colleges Crossing and other roads remain closed and The Bureau of Meteorology is predicting rain to last until the coming weekend.

It is bad news for an already rain-soaked region still suffering from flooding in the west, numerous road closures and pot hole littered streets.

Residents in western areas like Brightview are still cut off, while Colleges Crossing – a vital link between Ipswich and Brisbane – will be shut for at least another few days.

It is the sixth time the crossing has closed in recent months, leading to calls for a new bridge there or a permanent crossing to replace the Moggill Ferry, which is also closed.

Ipswich City Council works committee chair Trevor Nardi said it was "all hands on deck" for road maintenance crews as they battled pot holes and other damage across the city.

"It's more frustrating for the residents than it is for the crews," Cr Nardi said.

"We could still get months of wet weather, from the predictions. We could be busy for the next few months."

He said the estimated clean up cost for Ipswich was still between $750,000 and $1 million.

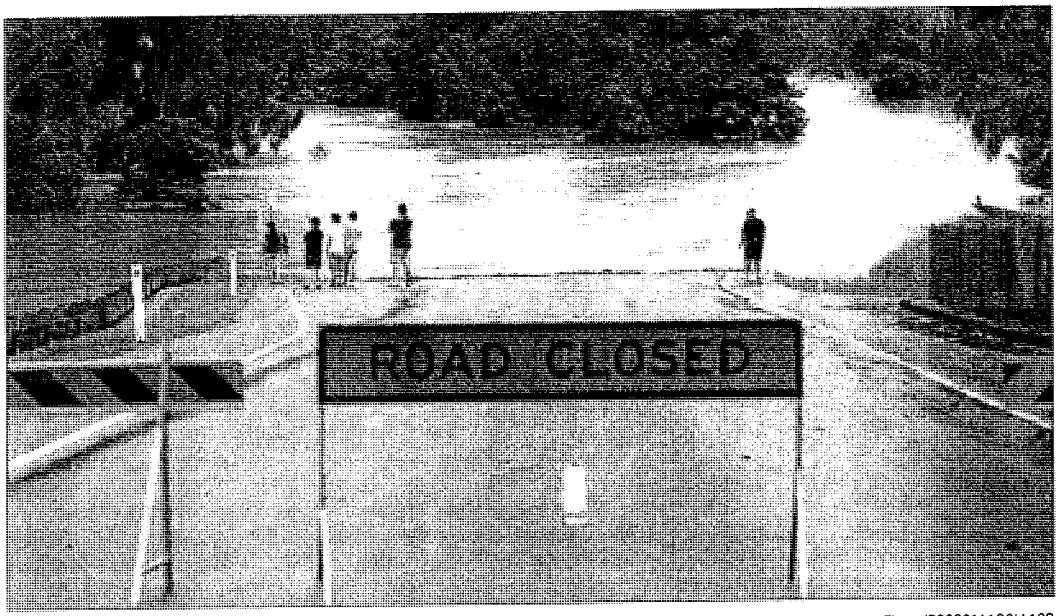
A Transport and Main Roads spokesperson said the eastbound left land of the Warrego Highway at Helidon was closed due to pavement damage while the Kholo Bridge was also closed.

Mt Sylvia Road was closed from the second last floodway due to road damage.

Traffic was also affected by flooding at various spots on the Brisbane Valley Highway at Toogoolawah, with similar problems on the Esk – Kilcoy Road.

Police were again warning motorists to drive to conditions and to not cross flooded roads.

Forecasters predicted the wet weather hampering the state could last until March.



CLOSED: Colleges Crossing was cut off again on Sunday. Photo: Rob Williams / The Queensland Times IPS090111COLL108

Copyright Agency Ltd (CAL) licenced copy.

ONLINE COMMENTS

■ THE crossing either needs to be upgraded, or a bridge to service the Moggill / Bellbowrie area built somewhere convenient along the river. The government does not blink an eyelid about the exotic and expensive bridges built on the Ipswich Motorway upgrade, but can't find funds to service a bridge across the river. The people of Ipswich area seem to be for a bridge, but it is the folk in Moggill who won't allow an upgrade to the situation.

Redcat from Bundamba

■ IT IS imperative that a new, high-level bridge be built at Colleges Crossing to serve not only the local residents but also the needs of the motoring public generally.

Trained from North Ipswich

■ THIS government has repeatedly wasted money – Traveston Dam, Health Payroll System Fixes, an unused Tugun Diesel Plant and countless other schemes. Valuable projects have no chance with a government so inept at providing value for the taxpayer's money.

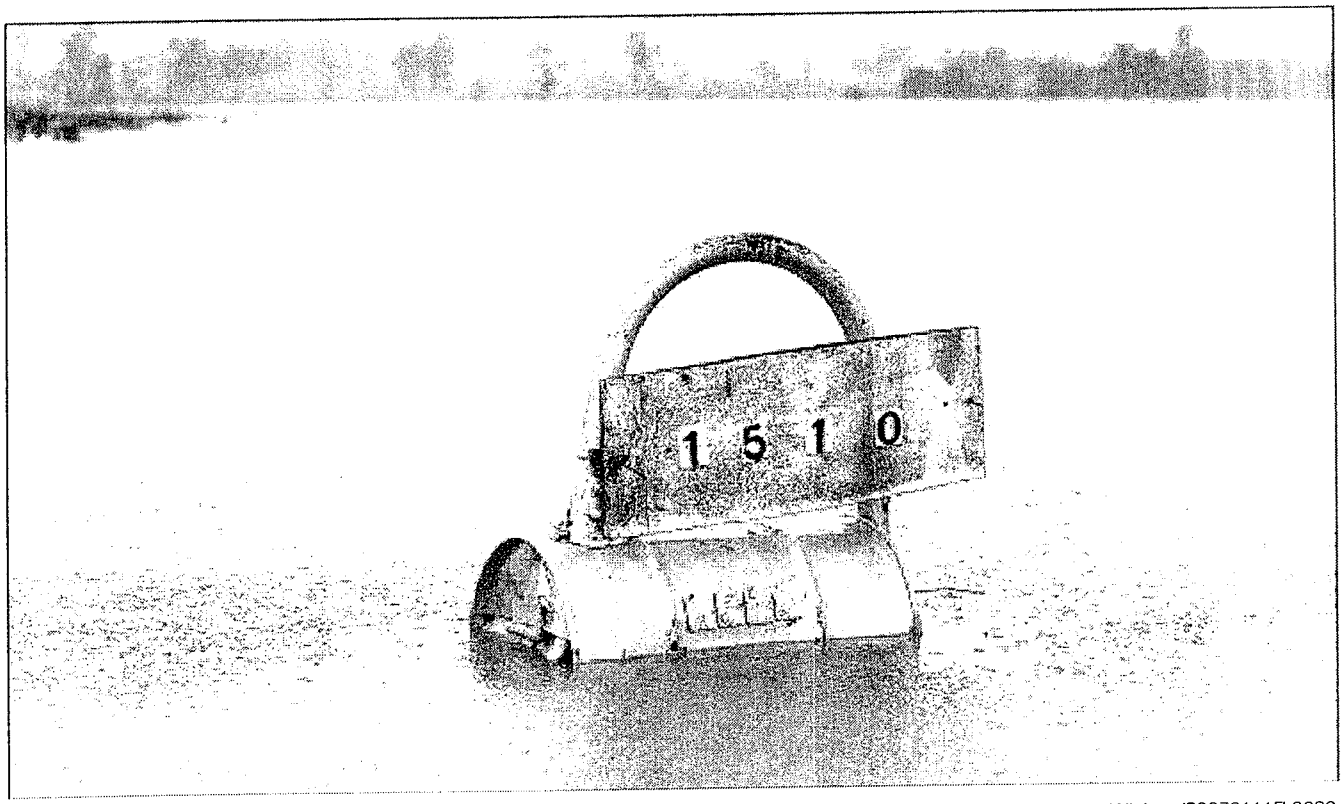
Michael40 from Kholo

■ Think about this dispassionately: Whenever there is above average rainfall, there is no way to cross the river upstream of the Jindalee bridge. Around 30 km away is the single-lane Mt Crosby weir and associated dirt track. In a city of this size, that is simply absurd. This could only happen in NIMBY (not in my backyard) Brisbane, where the cable ferry is still a key piece of the road network.

MDD4305 from Woodend

■ MOVED to Karana Downs eight years ago and have seen Colleges Crossing go under only two or three times until recently. It's fine as is, the $20m can be spent on more worthy pursuits like a high school in the area – ha, like that's going to happen.

KDcowboy from Karana Downs

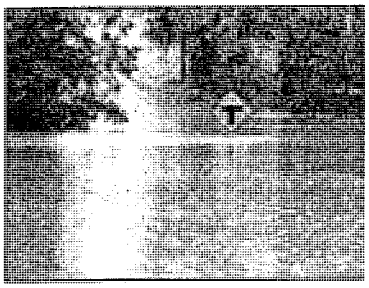


DAMP DELIVER: A letterbox on Brightview Road when Plain Creek flooded the area. Photo: David Nielsen IPS070111FL008C

Copyright Agency Ltd (CAL) licenced copy.



CARS deal with the massive puddles on Albion Street, Brassall, after yesterday's downpour.
Photo: Rob Williams IPS090111RAIN10A



JENSENS Swamp Road.
IPS070111FL008E



FLOOD water flowing into a creek at Warrill View on Friday.
IPS070111SCEN07F



HORSES in sodden fields off the Forest Hill Fernvale Road.
Photo: Claudia Baxter
IPS060111LOCK06L

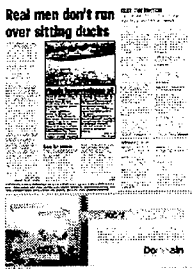


FLOODING at Grantham
IPS060111LOCK06A

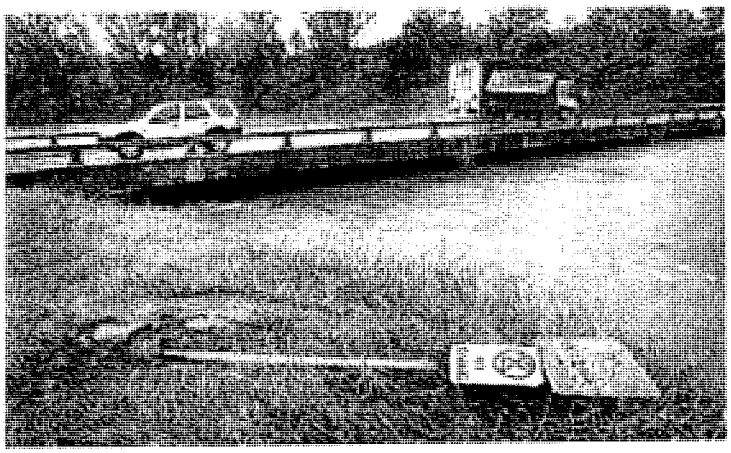
Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back


Real men don't run over sitting ducks

Queensland Times
10-Jan-2011
Page: 9
Letters
Market: Ipswich QLD
Circulation: 10512
Type: Regional
Size: 122.90 sq.cms
MTWTFS-



Floods inconvenience all

AS a resident of Mount Crosby for 17 years, I have experienced the inconvenience of Colleges Crossing being closed due to water release from Wivenhoe Dam and flooding rains.

However, to put this in perspective, the closure of Colleges Crossing has occurred less than once every two years, on average, during the past 17 years.

The alternative route via Allawah Road is a gazetted road that has been there since the days of the rail line to Mount Crosby.

The Brisbane City Council and Ipswich City Council have worked well to keep this road maintained and patrolled for the duration of the closure of Colleges Crossing.

For the few times a decade the crossing is not accessible, spending in excess of $20M for an eyesore, is in my opinion, not a valid option.

Upgrade Allawah Road and ask that the residents of Allawah Road show some community spirit when floods inconvenience us all.

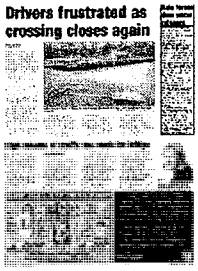
Allawah Road is a public road Tim Cashion, not a private driveway.

RAY MOXON
Mount Crosby

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back


Drivers frustrated as crossing closes again

Queensland Times
08-Jan-2011
Page: 6
General News
Market: Ipswich QLD
Circulation: 10512
Type: Regional
Size: 79.33 sq.cms
MTWTFS-

Rain forces dam water releases

HEAVY rain in the Ipswich region has forced water grid managers to make water releases from the Somerset and Wivenhoe Dams.

One gate was opened at Wivenhoe yesterday, with officials expecting releases to continue over the weekend.

Water from Somerset Dam is being released into Wivenhoe Dam through a regulator valve.

Officials said the releases may be increased to utilise sluice gates over the weekend.

An SEQ Water Grid Manager statement said they expected there would be no impact for Fernvale Bridge or Mt Crosby Weir Bridge.

The rate of release will be similar to last week, at up to 130,000 megalitres per day.

Due to water levels, Wivenhoe Dam is expected to be closed to all water-based recreational activities today and tomorrow at least.

Lake Somerset is also closed to recreational activities over the weekend and possibly into next week.

A spokesperson for the Toowoomba Regional Council said it was no longer pumping water from Wivenhoe to its main dam, Cressbrook Creek.

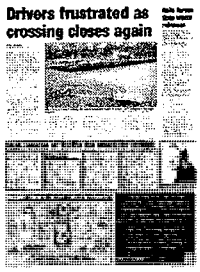
Toowoomba's total dam capacity is at 67.1 per cent, up from the 24 per cent level it was at only months ago in October.

Both the Wivenhoe and Somerset are at full capacity.

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back


Drivers frustrated as crossing closes again

Queensland Times
08-Jan-2011
Page: 6
General News
Market: Ipswich QLD
Circulation: 10512
Type: Regional
Size: 150.84 sq.cms
MTWTFS-

High volume of traffic too much for bridge

YVONNE GARDINER
ygardiner@qt.com.au

THE ramshackle detour that drivers are forced to take along Allawah Road at Chuwar when Colleges Crossing is under water is clearly unsafe for the high volume of traffic it now carries.

This part-dirt, potholed road includes the one-lane Mt Crosby Weir bridge.

I declare an interest in this issue – I live at Mt Crosby and, with thousands of other commuters, have to negotiate this Third World piece of infrastructure.

At the very least, the responsible council could look at making this road safer by sealing the dirt with bitumen.

With more rain forecast and Wivenhoe Dam at capacity – leading inevitably to more closures of Colleges Crossing and the Kholo bridge and the cancellation of Moggill Ferry services – traffic along Mt Crosby and Allawah roads will be heavier than in the past.

Mt Crosby Road is a vital, alternative route between Queensland's fastest-growing city, Ipswich, and its capital.

To say this route merely caters for residents in the western Brisbane suburbs like Karana Downs and Lake Manchester who travel to Ipswich is misleading.

Many drivers use it – one estimate is 10,000 cars a day – to avoid the frequent delays and construction go-slow on the Ipswich Motorway and the antiquated Moggill Ferry.

Once the school term begins later this month, the traffic on Mt Crosby Road will escalate.

The Department of Transport and Main Roads is apparently conducting a traffic study of this route. Hopefully we'll see conclusions and recommendations by the end of this year.

It's about time some kind of thorough research was done by the State Government to determine whether a new bridge is needed across the Brisbane River at Colleges Crossing.


SAFETY CONCERNS: Reporter Yvonne Gardiner gives her view.

Copyright Agency Ltd (CAL) licenced copy.

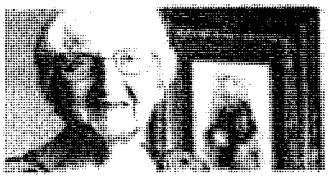
MEDIA MONITORS

back



Queensland Times
08-Jan-2011
Page: 18
General News
Market: Ipswich QLD
Circulation: 10512
Type: Regional
Size: 399.66 sq.cms
MTWTFS-

Water supply's fiery test



TIMES PAST

with Beryl Johnston

TENDERS were called in June 1876 to contract for work in connection with the Ipswich Water Supply, consisting of service reservoir, well, tunnel and breastwork at the pumping station.

All metal work for the project was ordered from England, and Mr Highfields, the superintendent, hoped to have water laid on in Ipswich by July 1877.

Early in 1876 the tender of Mr JT Biggs was accepted, with his quote of 5175 pounds five shillings being the lowest received. The highest quote was for 5970 pounds.

By October 1876 the Ipswich Waterworks was well on the way to becoming a reality. The reservoir when completed would be 100ft long, 50ft wide, 20ft deep and capable of holding 377,000 gallons (about 136,383 litres).

At the construction site there was a wheelwright's and blacksmith's shop, stables, stores and a brickfield. Some 30,000 bricks had been made and men were building a kiln in which to fire them. A short distance away from the site was a quarry where stone needed for the works was obtained.

By June 7, 1878 water had been introduced into the town of Ipswich and a very successful trial took place at North Ipswich.

The important duty of opening the valve which gave Ipswich access to the new water supply was entrusted to John Thorn.

The *Queensland Times* reported "One of the fire plugs near the locomotive stores at North Ipswich was opened and a stand pipe inserted. After a while, water bubbled and gushed forth with great force. A hose was then attached and the water sent to mid-air. This must have convinced those present that in the introduction of water we have something more than an indispensable luxury – viz – a most useful aid in the event of fire".

Even though some water pipes were laid down by June 1878, there was not sufficient water to cope with a disastrous fire which occurred in Ipswich in July 1878.

The Ipswich Municipality was calling for a competent engineer to take charge of the whole of the Ipswich Waterworks which in 1878 had been taken over by the council.

In 1879 a separate rate, to be called a water rate, was implemented by the council. Charges were to be: - business premises five per cent; business premises with residence combined seven and a half percent; and private residences only 10 percent on the assessed annual value.

Breweries, foundries, mills, factories, bakers, butchers, publicans, public offices, public schools, contractors for buildings, gardens etc were to be subject to special rates.

The official opening of the Ipswich Waterworks and water supply was celebrated on February 13, 1879. The site of the new works is now named Kholo.

Town Market

VERY little in the shape of buildings or other improvements had been effected in Ipswich in 1866; the builders trade evidently sharing the general Depression.

The only building worthy of note that had been commenced was the town market. It was to be of wood, but very substantial. The length was 126ft, width 37ft and average height 20ft.

The front of the market would face East Street and have shop windows on each side of the principle entrance. In the centre would be a 15ft 6ins wide corridor with side doors leading to cart lanes. The structure was expected to cost 800 pounds.

Meat curing

THE most important meat curing establishment in Ipswich in 1867 was that owned by a Mr Davis.

Mr Davis cured meat by the Morgan patent process in premises at the Old Town Marie situated about four miles from Ipswich on the Bremer River.

1894 businesses

MISS B. Joice conducted a millinery and dressmaking business at the corner of Nicholas and South streets Ipswich in 1894.

JA Bishop had the West Moreton Cleaning and Dye Works opposite the Baptist Church Brisbane St in 1994. Charges were: coat cleaned, dyed and pressed two shillings and sixpence; trousers two shillings; suits five shillings and ladies' dresses dyed any colour from two shillings and sixpence.

Mr EWF Kruger's coach building and general blacksmithing business was situated in Brisbane St West Ipswich in 1894.

Mr Kruger worked for six years as head blacksmith for Mr AE Roberts.

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back

Queensland Times
08-Jan-2011
Page: 18
General News
Market: Ipswich QLD
Circulation: 10512
Type: Regional
Size: 399.66 sq.cms
MTWTFS-

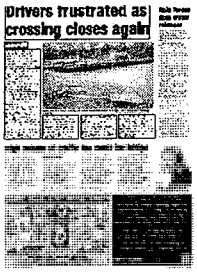


WATERHOLE: A popular waterhole for Ipswichians in earlier days was part of Colleges Crossing.

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Queensland Times
08-Jan-2011
Page: 6
General News
Market: Ipswich QLD
Circulation: 10512
Type: Regional
Size: 355.25 sq.cms
MTWTFS-

Drivers frustrated as crossing closes again

ZANE JACKSON
zane.jackson@qt.com.au

IN what is becoming a recurring headache for many Ipswich residents, Colleges Crossing closed again yesterday due to increased rain and dam releases.

An Ipswich City Council spokesperson said it was the sixth time the Mt Crosby Road crossing over the Brisbane River had been closed since October last year.

In the 12 months prior to October 2010, the crossing had only closed twice.

But with forecasters predicting wet conditions to last until March, Ipswich residents face the possibility of the crossing closing more times in the coming weeks.

Colleges Crossing was closed yesterday after the water grid managers opened one gate at the Wivenhoe Dam.

The Moggill Ferry also stopped running yesterday, funnelling those wanting to cross the Brisbane River into the one-lane Mt Crosby weir crossing.

The SEQ Water Grid manager said in a statement that Wivenhoe Dam releases could close for some time.

"Releases will be reviewed and may change depending on rainfall, inflows into the dam and river flows," the statement said.

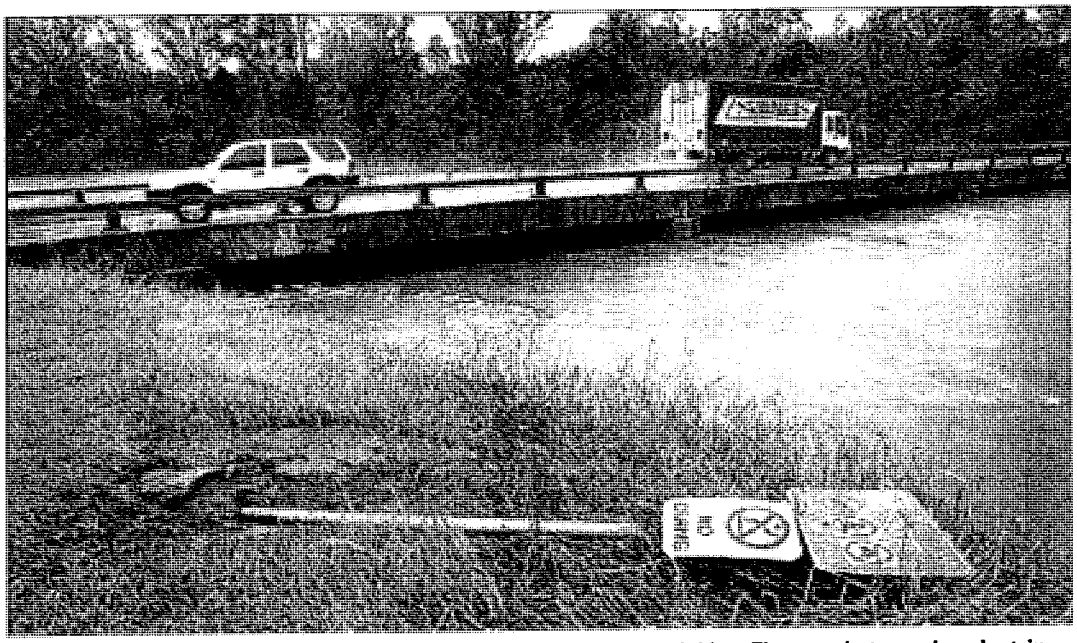
"Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing may be inundated for several days."

Recurring flooding due to the releases has prompted debate this week about the adequacy of the crossings over the river.

Ipswich Mayor Paul Pisasale and Member for Moggill Dr Bruce Flegg, whose electorate covers the Brisbane side of Colleges Crossing, called for improved infrastructure at the Chuwar site.

Cr Paul Tully has also slammed the inadequacy of the Moggill Ferry, calling for it to be replaced with a bridge.

Transport and Main Roads is part-way through a traffic study of Mt Crosby Road to see if it is capable of handling future traffic demands. However, Member for Ipswich West Wayne Wendt said it would be hard to justify the cost of building a bigger bridge over Colleges Crossing.



WATER WOES: Colleges Crossing with water flowing just beneath the bridge. The crossing was closed again yesterday. Photo: David Nielsen IPS060111COLL07D

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back

Summaries - Australian Financial Review
10-Jan-2011
Page: 40
Property
Market: Australia
Circulation: 77046
MTWTFS-

HEADLINE: Shaken funds look to retail sector

AUTHOR: Michael Hobbs

Capital is being raised by many unlisted property funds via the retail investor market. According to Louis Christopher of Adviser Edge, "Some groups have looked at the [elevated capitalisation] rates of unlisted property and think it could be a good opportunity especially if the economy continues to recover." Investor groups include Century Funds Management, Real Estate Capital Partners, Charter Hall Group and GDI Property Group. Century is expected to raise funds via a trust including Medtronic House purchased from Valad Property Group - a building occupied by Link Water, Opus Qantec McWilliam. Real Estate Capital Partners' Property Trust 3 unit holders will need to decide what is to be done with the unlisted entity, as debts are owed to Royal Bank of Scotland (one option is to sell the asset Sydney Opera House Car Park, another is to refinance and raise capital of $40 million potentially).
© Media Monitors Pty Ltd 2011

This summary may not be provided to any third party for any purpose without the express permission of Media Monitors Pty Limited ABN 11 002 533 851. Summary may be subject to error or omission. Subscribers should refer to the original article before making any financial decisions or forming any opinions.

MENTIONS: Royal Bank of Scotland, Sydney Opera House, Valad, Charter Hall

Due to copyright restrictions a press clip cannot be provided for this Fairfax Business Media publication

MEDIA MONITORS

back

Summaries - Australian Financial Review
08-Jan-2011
Page: 7
General News
Market: Australia
Circulation: 77046
MTWTFS-

HEADLINE: Hypocrisy on dam plan: Gillard

AUTHOR: John Kerin

The Federal Opposition's new water and food security platform has been ridiculed by Prime Minister Julia Gillard, who suggested that past failures in creating dams were largely the doing of the Coalition and its state allies. Andrew Robb, shadow finance minister, will head Tony Abbott's taskforce dedicated to the investigation of new dam locations. Speaking to Sky News, Queensland Premier Anna Bligh, in the midst of flood relief duties, requested that the Coalition refrain from such debate and focus on helping relief. Bob Brown of the Federal Greens said dams would increase flood risks while doing all sorts of environmental damage to forests, farmland, wetlands and fisheries. Anthony Albanese, Federal Infrastructure Minister, stuck to Gillard's line, suggesting that the Coalition caused the failure of the Traveston Dam. Peter Garrett dismissed that plan in 2010. Kristina Keneally, NSW Premier, recently abandoned the Tillegra Dam in the Hunter Valley. Across the nation, desalination plants have been pursued in the name of water security, for greater cost but lesser controversy than a comparable dam.

© Media Monitors Pty Ltd 2011

This summary may not be provided to any third party for any purpose without the express permission of Media Monitors Pty Limited ABN 11 002 533 851. Summary may be subject to error or omission. Subscribers should refer to the original article before making any financial decisions or forming any opinions.

MENTIONS: Julia Gillard, Sky News

Due to copyright restrictions a press clip cannot be provided for this Fairfax Business Media publication

MEDIA MONITORS

back



Sunday Mail Brisbane
09-Jan-2011
Page: 24
Event
Market: Brisbane
Circulation: 525477
Type: Capital City Daily
Size: 659.17 sq.cms
------S



True colours: Tina Arena, Summer Burke, Brendan Capell, Alison Fletcher and (above) Rachel McAdams and Harrison Ford in Morning Glory

Few affectations



IT HAS certainly been the wet summer forecasters were predicting as Ten News reporter **Summer Burke** discovered when she received an on-air drenching. Burke – who, on January 29, starts as weather presenter for Channel 10's new Queensland weekend bulletin – was reporting live from Wivenhoe Dam and, due to spray coming off the spillway, got completely soaked. Once the cameras stopped rolling, the normally picture-perfect Burke was approached by several bystanders requesting photos beside the dripping reporter. Casting aside all vanity, she kindly obliged. The 28-year old has a big year ahead with an October wedding to property developer Bradley Norris and an ambassadorship (along with ironman **Shannon Eckstein** and model **Lauren Phillips**) for NetFest 2011, a weekend festival for netball aficionados to be held on the Goldy in September.

WHILE most Aussies will fire up the barbie on Australia Day and knock back a few coldies, Brisbane long-distance swimmer **Brendan Capell** will jump into Sydney Harbour for a 2.5km swim. Capell, along with mates **Ky Hurst** and **Geoff Huegill**, is a youth ambassador for The Black Dog Institute's Exercise Your Mood program. The event will raise funds for the organisation and awareness for the benefits exercise has on a positive lifestyle and state of mind. The swim – part of The Great Australian Swim Series – should be a breeze for the 26-year-old who last year swam the Strait of Gibraltar (from Spain to Morocco), along with an English Channel attempt that ended just 4km from the finish in France when Capell was pulled out due to hypothermia. The next event in the series will be at Coolangatta on Saturday and is open to the public to participate. Visit: swimseries.com.au

FINDING myself seated next to *Today's* **Alison Fletcher** at the preview screening of *Morning Glory* I was curious to hear what she thought of the film that depicts the frenzied behind-the-scenes of a US morning show with the main character (played by Rachel McAdams) dreaming to work on the US version of *Today*. Fletch's verdict? A definite thumbs-up.

DAR Tip: Tune in tonight to the *Sunday Mail/Courier-Mail*/Channel 9 Flood Relief Appeal from 6.30pm. Being broadcast live from Suncorp Piazza, the telethon will feature **Tina Arena**, **Jessica Mauboy** and **David Campbell**. Donate by ringing 1800 219 028.

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back

Sunday Mail Brisbane
09-Jan-2011
Page: 24
Event
Market: Brisbane
Circulation: 525477
Type: Capital City Daily
Size: 659.17 sq.cms
------S

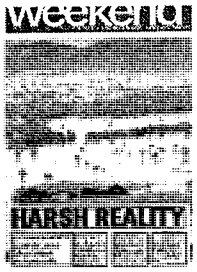




Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Sunshine Coast Daily
08-Jan-2011
Page: 33
General News
Market: Maroochydore QLD
Circulation: 20603
Type: Regional
Size: 1544.83 sq.cms
MTWTFS-

HARSH REALITY

Extremes in weather across the nation fail to dampen the Aussie spirit

The official weather forecast for Rockhampton on Thursday was accurate enough, in an understated, Australian way. Showers and a possible thunderstorm or two.

Just enough to keep about one million square kilometres of Queensland under water.

It is estimated that the volume of the stuff swirling through Rockhampton each day this week is equivalent to twice the amount in Sydney Harbour.

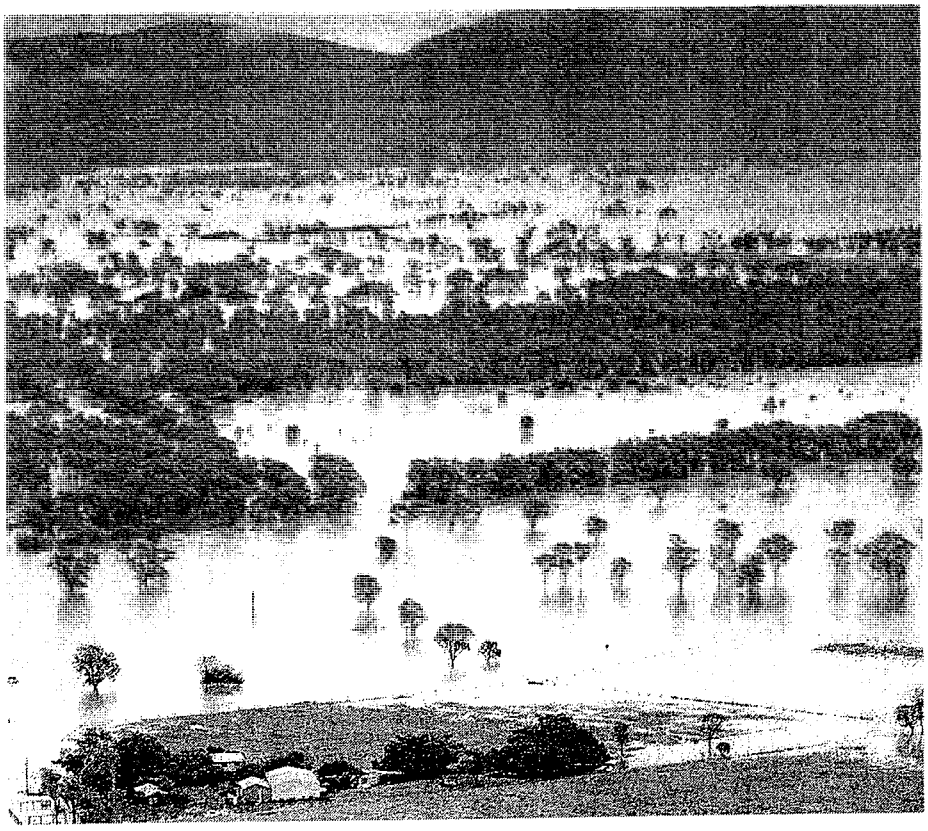
The floods in north-eastern Queensland have so far flowed into 40 communities, affecting 200,000 people and inundating 1200 homes.

By Wednesday this week, they had reached a peak just below the highest level recorded in Rockhampton.

On Thursday it was feared the "storm or two" would bring on another attempt on the record.

At the same time, on the other side of the planet's driest continent, the Gascoyne River in Western Australia was flooding for the second time in a fortnight, a bushfire burned out of control in the Adelaide Hills, Melbourne enjoyed a perfect summer day and in Sydney a drop of rain was insufficient to save the nation's struggling cricketers.

CONTINUED ON PAGE 36



Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back

Sunshine Coast Daily
08-Jan-2011
Page: 33
General News
Market: Maroochydore QLD
Circulation: 20603
Type: Regional
Size: 1544.83 sq.cms
MTWTFS-

Yet another shuffle is on the cards

FROM PAGE 33

BUT this is Australia, the ironic country, and it is likely the weather cards will be shuffled again by next week and a new drought will have begun, or summer snow will have fallen or a cyclone will have arrived where it never has before.

It is also a country where the two most populous states have built desalination plants to ensure their populations have enough water. And Queensland has also built one at Tugun on the Gold Coast but this is not needed... for the moment.

Variable, unpredictable, cruel weather is a fact of life in Australia.

Only 20 per cent of the country receives more than 600mm of rain each year, 40% of that is sand dunes – and then there's El Nino and La Nina and the Southern Oscillation Index.

As well as shaping the land itself, the weather has shaped the Australian character.

The past few weeks have produced the best of it in Queensland from where there have emerged images and stories that typify Australia.

Moving accounts of loss and despair finished off with a grin or a shrug and a "not much we can do about it".

Farmers surveying hectares of flooded paddocks that a year ago were dustbowls, and declaring it could be worse.

"At least it keeps the rabbits down."

In the towns where thousands of people have been forced from their homes, there is dark humour in blue singlets.

In Emerald, west of Rockhampton, a local couple sat on the front steps of their "Queenslander" and told an ABC reporter passing in his boat that they'd be fine.

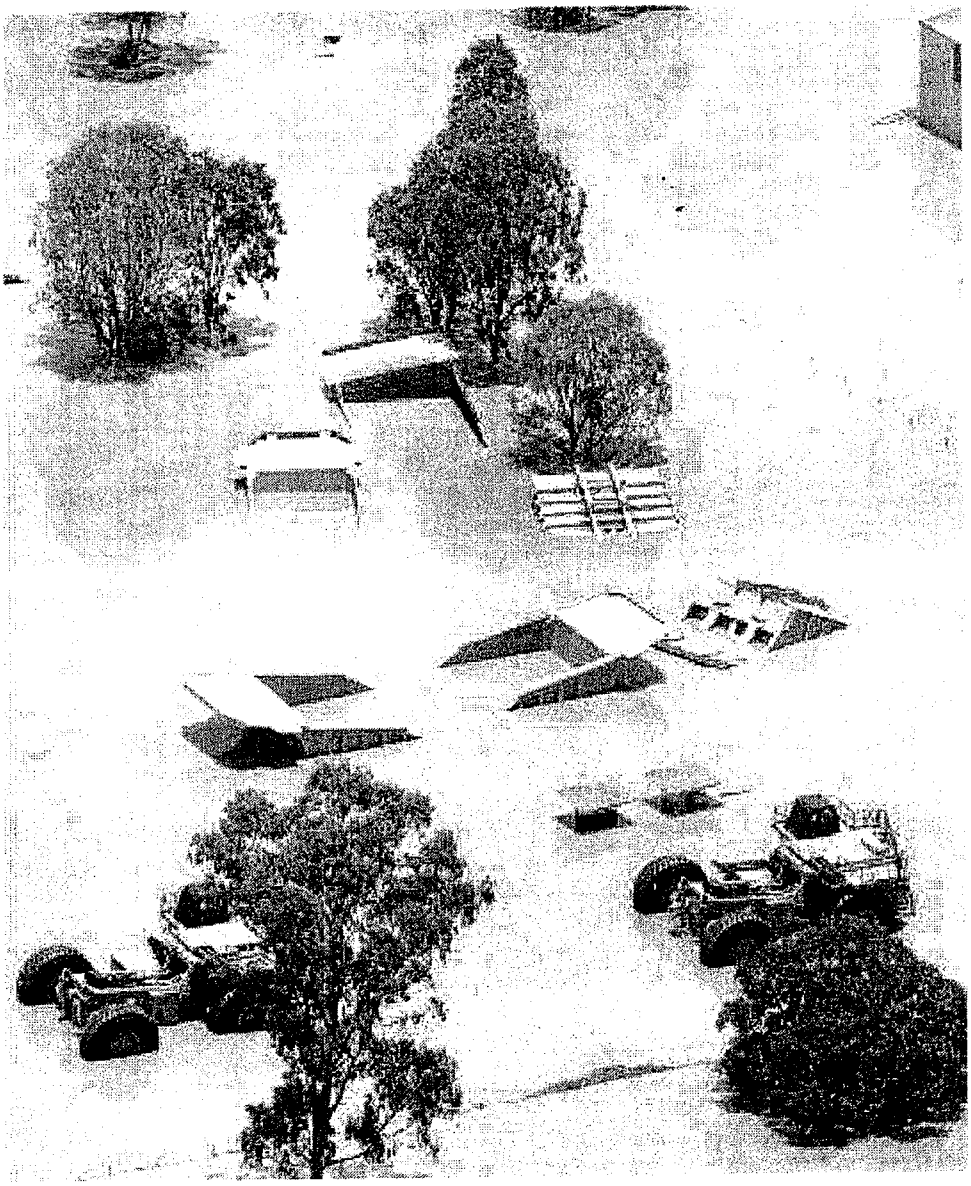
"Mate, we're high enough ... we've never had dinner or breakfast over the water before, so we're havin' it now."

As Victoria's bushfires of almost two years ago did, the Queensland floods have become a curiosity around the world.

Among the staggering comparisons trotted out to try to explain the magnitude of the floods, European audiences have been told

Copyright Agency Ltd (CAL) licenced copy.

Sunshine Coast Daily
08-Jan-2011
Page: 33
General News
Market: Maroochydore QLD
Circulation: 20603
Type: Regional
Size: 1544.83 sq.cms
MTWTFS-



DOWN BUT NOT OUT: Many Queenslanders have lost all their worldly possessions but stand resolute in their determination to rebuild. *PHOTOS: AAP/NEWSMAIL*

Copyright Agency Ltd (CAL) licenced copy.

Sunshine Coast Daily
08-Jan-2011
Page: 33
General News
Market: Maroochydore QLD
Circulation: 20603
Type: Regional
Size: 1544.83 sq.cms
MTWTFS-

the area of Queensland that is underwater is roughly equivalent to the land mass of France and Germany combined.

It is probably stretching comprehension to add that at the same time, the worst floods in 50 years in Western Australia's Gascoyne region are affecting an area about two-thirds the size England.

At home the numbers are more relevant.

The floods are estimated to subtract up to $5 billion from the Queensland economy and about $3 billion from the nation's bottom line and will have an impact on every household in the nation through rising food prices and inflation.

The northern half of Queensland is cut off from the south, roads and railway lines will have to be replaced and the state's coal mining industry, the supplier of some 30% of the world's thermal coal, is reeling.

Queensland Premier Anna Bligh, under siege electorally, is now facing a greater dilemma.

"I don't want to waste a second in the huge recovery and rebuilding taskforce ahead of us," Ms Bligh said.

"This is a disaster of an unprecedented scale and it will require an unparalleled rebuilding effort."

Never has a greater area of Australia been submerged to the extent it is today.

There have, however, been more disastrous floods.

In 1852 in Gundagai 89 residents died and only three homes were left standing when the Murrumbidgee flooded and in 1974 in Brisbane, Cyclone Wanda initiated the most extensive flooding in a single Australian city claiming 13 lives.

Water from that flood affected 40 suburbs, 9000 were evacuated, 56 homes were swept away and a further 1600 submerged.

As widespread as the latest floods may be, as disasters, they certainly pale in comparison to the worst.

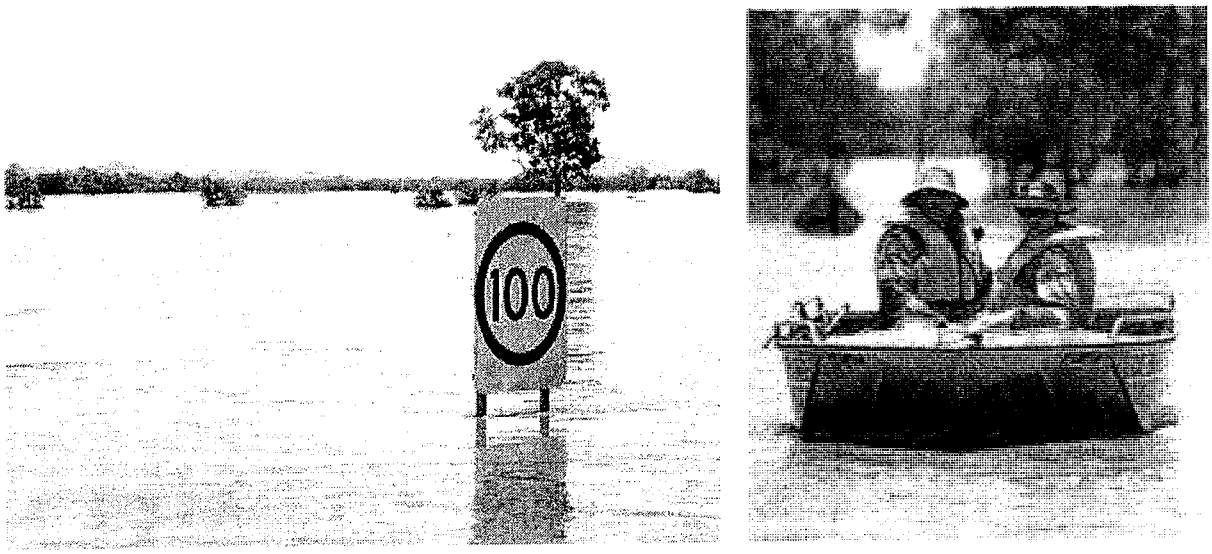
The 2010 Pakistan flood affected 10 million people and claimed almost 2000 lives.

In 1998 the Yangtze River flooded, leaving 14 million Chinese homeless and in 1931, again in China, some four million died and 80 million lost their homes.

In Queensland, 10 have died in the latest floods.

It isn't much good up north, but as they say, it truly could be worse.

-AAP



TEST OF CHARACTER: Australians may not have been able to stop the rising waters but are quick to help and look on the bright side

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Sunshine Coast Daily
08-Jan-2011
Page: 4
Real Estate
Market: Maroochydore QLD
Circulation: 20603
Type: Regional
Size: 1877.41 sq.cms
MTWTFS-

Are you prepared for summer storms?

Michele Sternberg looks at the finer points of being storm-ready

THE rumble of thunder rolls through the muggy atmosphere. Lightning cracks and rain drops the size of a 10 cent piece begin to fall, leaving wet splats on the concrete. One by one they fall and then the clouds open. Summer storms – you either love them or hate them.

The past few weeks have seen these storms mix with tropical lows, dumping so much rain that Queensland's river systems are overflowing.

To give you an idea of just how much rain has fallen, Wivenhoe Dam is at 112% capacity – and that's after releasing 450,000 million litres of floodwater in the seven days after Boxing Day, equivalent to three-quarters of Sydney Harbour.

And the Bureau of Meteorology predicts we are in for even more rain this month.

Are you prepared?

Every home should have an emergency storm kit filled with the essentials, including a portable radio and torch with spare batteries and bulbs, candles with waterproof matches or a gas lantern.

Stocks of fresh water and tinned or dried food should also be kept on hand, along with a first aid kit and good supplies of essential medication, strong shoes and rubber gloves, plus a waterproof bag for clothing and valuables – collect valuables/certificates and place them in the bag in a safe place.

Compile a list of your emergency contact numbers and keep in a handy place.

Don't be caught by surprise. There are several measures you can take before the storm season hits.

One of the biggest dangers is a falling tree, or branches. So make sure you trim tree branches well clear of your house and have a professional come to remove any large trees that have died. Clear your yard of loose objects, including outdoor furniture and children's toys.

Water damage is another major problem and one can that often be averted. Check and clean

Copyright Agency Ltd (CAL) licenced copy.

Sunshine Coast Daily
08-Jan-2011
Page: 4
Real Estate
Market: Maroochydore QLD
Circulation: 20603
Type: Regional
Size: 1877.41 sq.cms
MTWTFS-

your roof, guttering and downpipes. Leaves can often block gutters and downpipes, forcing excess water into your home, while broken or cracked roof tiles will almost certainly allow water into your ceiling.

Another handy tip is to have a supply of plastic shopping bags which can be used as sand bags for emergency stormwater diversion.

Also have masking tape to protect windows and plastic sheeting or large garbage bags available for emergency rain protection.

When the storm hits, stay away from windows and glass sliding doors.

In cyclonic conditions, one of the safest and strongest rooms in the house is the bathroom or toilet. Mattresses or blankets are good to hide under and can provide protection in extreme situations.

Most of our summer storms are harmless, but it's always better to be prepared.

Insurance is another item many people don't consider closely until it is too late.

Did you know that most household insurance policies do not cover for flood damage?

This is usually an added extra. It will push up the price of your premium, but if you live in a flood prone area it could be money well spent.

Check that your insurance policy covers the existing contents of your home – you may find that during 10 years you have accumulated a fair bit of expensive electrical equipment, or done major renovations.

Building costs have risen quickly since 2007, meaning the cost of replacing your home has also risen. The most accurate way to establish a rebuilding cost is to engage a builder or professional valuer.

Before you do that, you may like to get an indication of your value. To calculate an approximate rebuilding cost, first measure the outside dimensions of your home, including the garage and verandas, in metres.

"Most of our summer storms are harmless, but it's always better to be prepared."

Multiply the length by width to establish the square meterage of your property.

If you have a second floor, measure this also and add to the ground floor measurements.

Multiply the floor areas calculated with the appropriate building costs outlined below.

For a project-style home, estimate your building costs at $1253 per sq m for brick veneer and $1306 for full brick.

If your house was built by a specialist builder and has a higher level of finish, increase that estimate for $2272 for brick veneer and $2408 for full brick. A prestige finish can be calcuated around $3130, while you should add up to 100% of costings for an architectural design.

Add $302 per sq m for a carport up to $666 per sq m for a brick garage with concrete floor, metal roof and roller door.

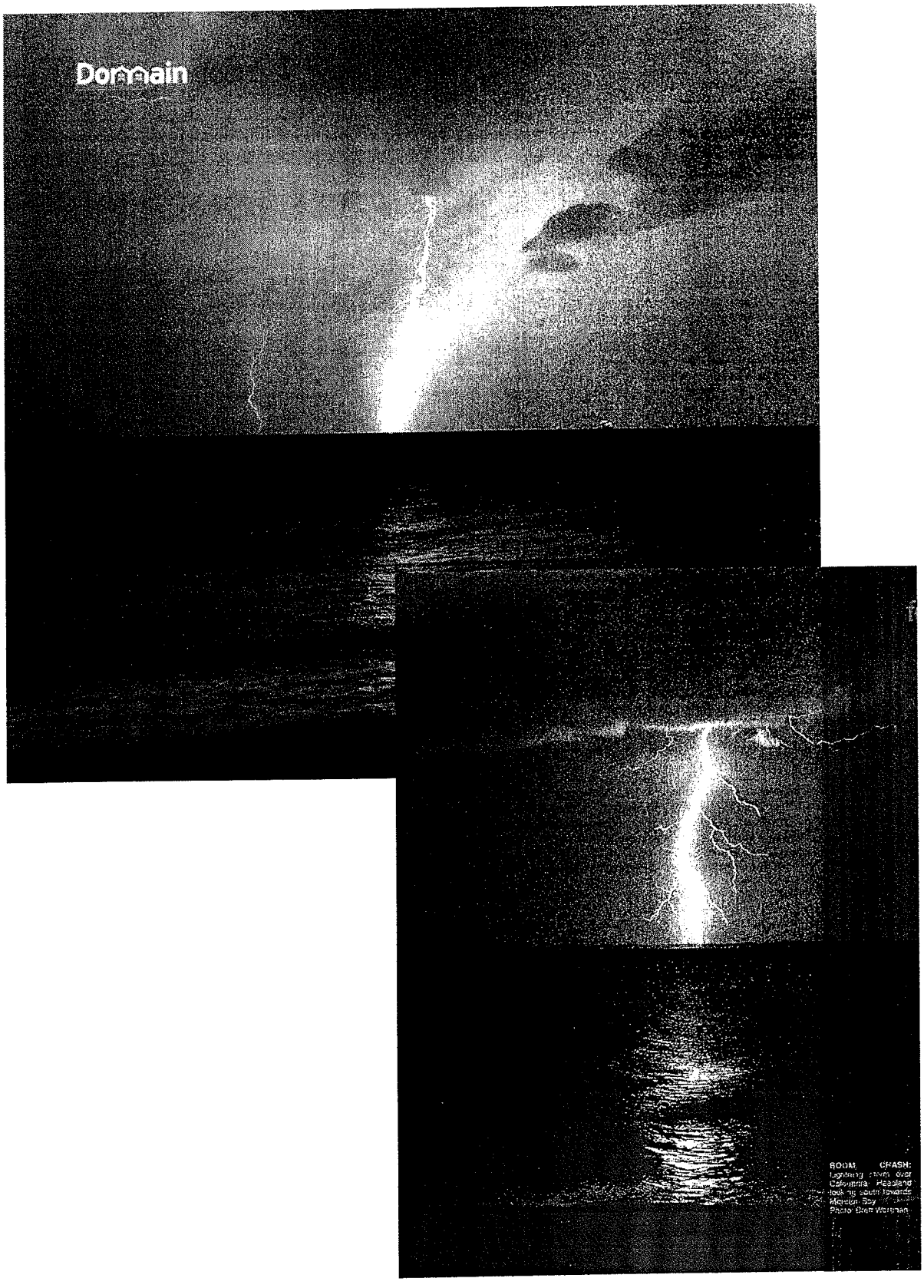
When you do the maths, you may quickly realise how much your insurance cover could fall short in the event of major storm damage.

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back

Sunshine Coast Daily
08-Jan-2011
Page: 4
Real Estate
Market: Maroochydore QLD
Circulation: 20603
Type: Regional
Size: 1877.41 sq.cms
MTWTFS-



Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Sunshine Coast Sunday
09-Jan-2011
Page: 3
General News
Market: Sunshine Coast QLD
Circulation: 36000
Type: Regional
Size: 160.04 sq.cms
------S

Pipeline progress delayed by weather

PROLONGED heavy rain has led to extensive delays in construction of the Northern Pipeline Interconnector stage 2 works on the Sunshine Coast.

Acting Minister for Infrastructure and Planning Desley Boyle said the bad weather had created safety and environmental concerns, meaning a three-week delay to major works was unavoidable.

"The risks involved in the nature of the pipeline works dictate that they should not be undertaken in the wet and the safety of the construction workers on-site and residents in the surrounding area is absolutely paramount," Ms Boyle said.

"Trade union representatives and workers are being advised of the situation and employees will be paid under the wet weather provisions in the project's Enterprise Bargaining Agreement.

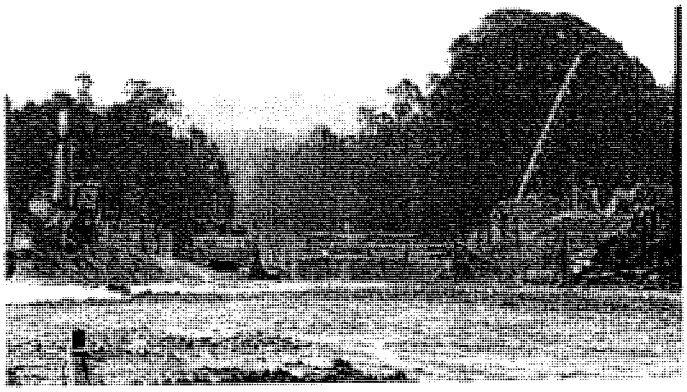
"We acknowledge that this interruption to major works is likely to mean delays on construction taking place on landowners' properties and thank local residents for their patience during this time.

"The Northern Network Alliance building the pipeline has today assured me that work will re-start when it is safe and practical to do so."

Limited works on structures and other facilities, including tunnelling, will resume tomorrow in areas where it is considered safe.

Ms Boyle said the impacts on project delivery and budget would be confirmed when full works could recommence.

The NNA's community information line, 1800 243 998, would continue to operate 24 hours a day, seven days a week to handle inquiries from the public.



TOO WET: Work on the Northern Pipeline Interconnector has been delayed due to inclement weather. *PHOTO: BARRY LEDDICOAT/177231*

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Toowoomba Chronicle
10-Jan-2011
Page: 1
General News
Market: Toowoomba QLD
Circulation: 22644
Type: Regional
Size: 374.91 sq.cms
MTWTFS-

Hundreds visit dams



By LACEY BURLEY
lacey.burley@thechronicle.com.au

THE rainy weekend didn't stop hundreds of people visiting Perseverance Dam to see water flowing over the spillway after the dam reached 100 per cent capacity on Friday afternoon.

Perseverance Dam has not reached spill point for 10 years.

Toowoomba Regional Council Water Services director Kevin Flanagan said the combined levels of Toowoomba's dams were at 73.6% at 7.30am yesterday.

Mr Flanagan said Perseverance Dam was at 101.4% and still spilling over.

Cooby Dam was at 80.6% while Cressbrook Dam was at 62.3% capacity yesterday morning.

Mr Flanagan said significant rain had fallen in the region since yesterday

● **TURN TO PAGE 4**



Leonie Bryant and her daughter Zoe Bryant braved the heavy rain to visit Perseverance Dam spillway yesterday. PICTURE: NEV MADSEN

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back

Toowoomba Chronicle
10-Jan-2011
Page: 1
General News
Market: Toowoomba QLD
Circulation: 22644
Type: Regional
Size: 374.91 sq.cms
MTWTFS-

Rainfall pushes up dam levels

● FROM PAGE 1

morning and predicted the combined dam levels to reach about 77% today.

Toowoomba Regional Council Water Services Portfolio leader Paul Antonio said it was great to see persistent heavy rainfall over the catchment areas.

"It is very positive," Mr Antonio said.

"Water from the Perseverance catchment goes over the spillway and into Cressbrook Dam.

"Cressbrook Dam will fill more quickly now."

Bureau of Meteorology senior forecaster Brett Harrison said Toowoomba residents could expect rain to continue until Wednesday.

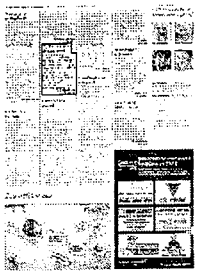
"Rain is set to continue through (today) to Tuesday and will become heavier at times, particularly (today)," Mr Harrison said.

After more rain on Wednesday morning, it should start to ease with just a shower or two expected on Wednesday afternoon. A total of 25.2mm of rain fell at the Toowoomba Airport between 9am and 5pm yesterday.

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Toowoomba Chronicle
10-Jan-2011
Page: 19
Letters
Market: Toowoomba QLD
Circulation: 22644
Type: Regional
Size: 29.84 sq.cms
MTWTFS-

Pipeline makes us drought-proof

I'M sure former mayor of Toowoomba Di Thorley would be proud to hear that Toowoomba's combined dam water storage is now two-thirds full. Only a year ago we were looking at recycling our water.

It's a good thing that we have the Wivenhoe to Cressbrook pipeline now, for if and when we have another drought we'll always have water.

I don't think the pipeline was a waste of ratepayers' money.

DAVID FREDERICKS,
Toowoomba

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Toowoomba Chronicle
08-Jan-2011
Page: 7
General News
Market: Toowoomba QLD
Circulation: 22644
Type: Regional
Size: 356.97 sq.cms
MTWTFS-

Dams hit spill points



By CALLUM JOHNSON
callum.johnson
@thechronicle.com.au

PERSEVERANCE Dam reached full capacity yesterday afternoon, as water flowed over the spillway for the first time in almost 10 years.

Significant rainfall yesterday pushed the level from 97 per cent in the morning to overflowing by 2pm.

The last time Perseverance Dam reached spill point was in February, 2001.

The current combined levels of Toowoomba's dams were at 67.1% yesterday morning and Toowoomba Regional Council anticipates all storage dams will reach near full capacity in the near future.

The last time the dams reached their current level was in July of 2002 and the last time they experienced a combined capacity of 100% was in March of 1999.

Cooby Dam was at 71.1% and Cressbrook was at 55.9% of capacity yesterday morning

Dam levels were expected to rise further due to water runoff and predicted storms over the weekend.

Things were a lot grimmer for Toowoomba's water supply at this time last year.

On January 7 in 2010, the combined total dam level was at only 8%.

Toowoomba Water Services Portfolio leader Paul Antonio said the dams were looking as healthy as they had been in a long time although it would be unlikely Toowoomba would ever abolish all water restrictions, even at 100% capacity.

Leslie Dam near Warwick reached spill point for the first time in more than 20 years on Wednesday night.



Elizabeth Barnes snapped this spectacular shot of Perseverance Dam overflowing yesterday afternoon. The dam reached 100 per cent capacity for the first time in a decade yesterday. PICTURE: ELIZABETH BARNES

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Toowoomba Chronicle
08-Jan-2011
Page: 6
General News
Market: Toowoomba QLD
Circulation: 22644
Type: Regional
Size: 32.66 sq.cms
MTWTFS-

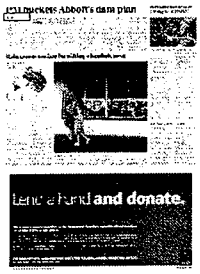
Cooby Dam Wall closed

Due to high levels of algal toxins present in raw water samples, council's day use area at Cooby Dam Wall is closed to public access until further notice. The closure is necessary as raw (untreated) water is supplied to all taps and toilet facilities at this location. Loveday Cove (also located at Cooby) remains open as water supplied to facilities at this location is sourced from a bore and does not contain algal toxins. The Dam Wall picnic area will not re-open until algal toxins return to the acceptable range. Water from Cooby is treated before being supplied to residents and this treatment removes toxins otherwise present in raw water.

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Weekend Australian
08-Jan-2011
Page: 5
General News
Market: Australia
Circulation: 300941
Type: Australian National
Size: 221.76 sq.cms

SID MAHER

PM buckets Abbott's dam plan

JULIA Gillard has dismissed Tony Abbott's taskforce to examine building more dams as a "plan for a committee" from a Coalition that had campaigned against new dams in Queensland and NSW in recent years.

Calling for national leadership and vision on water policy, the Opposition Leader yesterday announced that the Coalition's finance spokesman, Andrew Robb, would lead a frontbench taskforce to look at dams as part of the Coalition's water policy for the next election.

Mr Robb would be joined by water spokesman Barnaby Joyce, environment spokesman Greg Hunt and Murray-Darling spokesman Simon Birmingham, who would consult on dams policy and report back in 12 months.

"I think it's time that as a nation we put new dams back on our agenda . . . the Queensland flood disaster makes this very timely indeed, because dams can be flood-mitigation devices as well as water storages," Mr Abbott said.

"They can be a potential source of zero emissions power as well as water storages. They can be a source of environmental flows in dry times as well as just water storages." Mr Abbott said it was time to end dam "phobia", which had afflicted policymakers for the past two decades.

"Now I know that there are problems with many dam sites but I fail to see that there are no potential dam sites anywhere in Australia where the economic and social benefits outweigh any environmental cost," Mr Abbott said.

He said the Queensland floods showed Australia's problem was not so much a lack of water "but lack of water management".

But the Prime Minister said the Opposition Leader's announcement was "against a backdrop where members of Tony Abbott's political party have consistently opposed dam developments, so it's OK to say it in the broad, but to actually build dams you need people to embrace them in specific locations".

She said Coalition members had campaigned against the Traveston dam in Queensland and the Coalition in NSW had been hostile to a dam in the Hunter Valley.

Ms Gillard said the devastation caused by the Queensland floods would not have been lessened by dams and projects needed to be assessed on their merits.

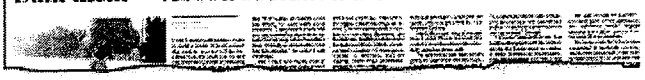
"Now if we look at what has happened in Queensland with the widespread devastation and flooding, we should not conclude that that would have been fixed by the building of a limited number of dams. That's simply not the case."

Greens leader Bob Brown called Mr Abbott's plan ill-conceived. "Dams can increase the risk of flooding and impose irreversible changes that damage forests, wetlands, fisheries and farmland, nor should the devastating Queensland floods cause any delay to Murray-Darling reforms," he said.

"Dams may prevent smaller floods but can increase damage during exceptionally large floods when severe weather events cause a sudden release of water," he said.

Independent MP Bob Katter backed more dams, particularly for north Queensland. "It's been 30 years since anyone's called for the building of dams. But go no further than the Good Book, I mean Moses got himself famous for telling the Pharaoh that you've got to keep some of the good stuff for the bad times." Mr Katter said.

Dam them — Abbott's solution to harness flooded rivers



How *The Australian* broke the story yesterday

Copyright Agency Ltd (CAL) licenced copy.

MEDIA MONITORS

back



Weekend Gold Coast Bulletin
08-Jan-2011
Page: 44
Letters
Market: QLD
Circulation: 39593
Type: Regional
Size: 689.24 sq.cms
-----S-

Chat room

0416 905 148

NOW in hindsight Anna Bligh, dont you just wish you had spent our money on building dams. Allconnex must be rubbing their hands together, everyone will need water to wash out their homes. When can we have some pollies with brains. – Freddie

GOOD on the guy who filmed the idiots in the jeep, but mate you were driving and filming at the same time, just as bad.

COUNCIL have u fixed the lights at 4th ave palm beach yet. they r stuffed 24/7! Do u understand?

TO the person who found my engagement & wedding ring at seaworld on Monday 3rd january, how about returning it as it has a strong sentimental value. What happened to honesty these days. just return it to seaworld no questions asked. by the way you wrecked my holiday. – Anna, WA

GREAT council clean-up around Main Beach post concert Monday. But are there msges on Macca cartons saying when finished, dump on footpaths, or if unable to finish, throw out on nearest main highway? Do these pigs throw their plates over their heads at home, or stub their butts out on the carpet? Who brought these people up?

THANK you Singapore for your generous support of troops and money towards floods. Will the gc bully report on who else has offered help? – TC.

IT'S all ova, the Poms have won the Ashes and Australia is lickin its wounds. I'm a Pom, lived here for 30 yrs and support Oz. No law against that! But I have to say the best team won. – Nobby

LIFELINE Burleigh opposite Treetops, Monday 3rd. People going thru bags of donations, not going back into bags but ending up strewn across car park. Helping themselves. People have left these things in good faith and belief they are going to help those in true need. Not for you to steal!

OH get ova yourself ozzie! Typical australian. On nzs part, think bak to the bushfires.

TALLY surf club. Great food nd service. Clean nd safe f families. Raffles every nite. All money raised goes t flood appeal.

TO all the people in the chat room who use it to whinge, get a life, if all uve got to whinge about is ur cafe then uve got a sweet life, think about others and issues more important.

THE hoff cant handle his grog. – Wilk.

WORKED for electricity company for 15 years as meter reader. we would get 30 cents per house.

HEY Ozzie, remember the fires of last summer. Nz sent crews to help Thr comrades. – Proud kiwi

RON Clarke, didn't anyone ever teach you its best to go out on high. The longer you wait the more you're sinking. – GQ

RE council cleaners who work tirelessly in hot humid windy rainy and generally tough conditions. walk in their shoes u pathetic individual. how about critising the people who leave the mess! your opinion is that of an unintelligent idiot. please dont think anymore, it just doesnt work for you!

TO Craig, if man is near the end why would we need to prepare? If it's the end, would be dead anyway. – Immortal

WHY havent we been told about the 300 male Muslim refugees being held at Weipa on double the pay Aust pensioners get and an airconditioned mosque to pray in. Why all the secrecy and why are Muslims so well looked after. – Bananabender.

FOR gods sake leave gerry harvey alone. hes a larrikan like his mate singo. They should let him and wife katie do what they want. Be it building 90 storey homes in main beach to running th nrl to running magic million to paying less tax and overheads. He'll let them shoot tied up endangered baby black rhinos if they choose. We are all beneath these giants of the retail world. Im running down th street as im texting to donate to the keep gerry a billionaire not a multi millionaire fund right now. – Consumer x

RE revving Harlies rubbish. They say an empty barrel makes the loudest noise. So, loud Harlies are ridden by air heads.

HARVEY Norman are dropping their prices to stay competitive? With their current mark ups on everything I'm surprised to hear they could ever compete. – The Salesman

LOCALS in R'Hampt proud of u standin' ur dig. Xperts say not safe, danger, lives at stake. Over paid tossers, our decision 2 stay. Free country still isnt it.

Copyright Agency Ltd (CAL) licenced copy.

Weekend Gold Coast Bulletin
08-Jan-2011
Page: 44
Letters
Market: QLD
Circulation: 39593
Type: Regional
Size: 689.24 sq.cms
-----S-

I'VE boycotted harvey norman for years not because he makes millions importing chinese plastic or that he whinges if we buy from other sources, i boycot him because of those horrible commercials he saturates us with, you cant go a day without hearing some excited tool yelling about yet another sale and then that chick at the end screeching Harvey Norman AGHHH! Please somebody make it stop. – Beardy

GRAFFITI vandals around palm beach area, look out u immature boys, yas r pathetic, grow the hell up! U've got the smiling whale on back hwy, i've got ur tag, am looking 4 u. Pathetic young brats grow up. Aaarrrgghh i wil find u! – Cull

WAS called a big steroid idiot on the door i work at sun nite ten mins later same lovely guy needed sec assistance go figure

'ANIMAL Awareness Day' say no 2 rodeo. Im not completly against but there is cruelty involved in some events + some r totaly harmless, no2 the cruelty. –Ruff

MR dont tailgate me; I suggest you try the rule 'drive in the left lane unless overtaking' then you wont have a problem, why so many drivers ignore this basic road rule is beyond me. – CJ

I HOPE all those who said they didn't vote for gillards joke of a government don't vote for them next time round. It's a joke, my intl students ask why we put up with them. I reply, no one will admit to voting for such a band of flotsam and jetsam. None have the slightest idea how to run a tuppaware party, never mind our country and our hard earned and stolen taxes. Shame on you labor.

WHO was the lunatic who designed light rail at road level? It should've been bridged.

EASTER eggs on the shelves already is a good idea I reckon. Means that I can start getting ready now for Easter and not have to get chockies all at once. it's called budgeting. I've even got some Xmas gifts for this year at the sales. Not all of us have an endless bank account. – Works hard for the money

IN 2005 i paid $110 to a professional engineer 4 a pool inspection. Now i c it will cost up 2 $300. Anyone else feeling robbed. – HB

THE hoff at main beach. where is our own ledgend warick capper. hes cheap and easy. – cb

I HAD 2 spend $6000 on nu pool fencing & rip out garden beds with my rental prop then @ an open house recently found that pool fencing @ this prop was approvd even tho it was only fencd on 1 side & had big garden beds on other side what the?

LOU these people arent needy they are greedy. happens every weekend. they act like they are going shopping, even bring utes for larger items, children on pushies follow the example set by the law abiding adults. its a shame most people can only have clean-out on weekend when shop is closed then the real needy would benefit. – Lee

HOUSE prices about to massively drop. check what rba, jeremy grantham say about property over valuation here, boom times over, get ready for hell!

SO the coast can never have too many rooms mr winter. I look forward to reading of the hiltons fabulous occupancy.

THE japanese wil continue to disgustingly slaughter whales, unless drastic, direct action is taken at a grass roots level, such as boycotting sushi bars/restaurants and japanese goods. A daylight 7 day a week picket outside japanese consulates/embassies worldwide wud undoubtedly 'big time' embarrass them and surely produce good outcomes.

GRUMPY old Reg states he never locked any doors or his car at nights while touring far western NSW towns and reckons there is no crime out there and says locals are safer than us here on the GC. The last time i drove the big rigs through towns like Nyngan and Cobar etc, shop windows barricaded up with heavy guage steel mesh panels. The GC has its crime pal but i haven't noticed any shops barricaded with heavy steel mesh panels, not like your old stamping ground like Redfern Sydney. – Ramrod

JUST think, if the useless Qld Labor Gov's over the years had gone ahead and built many huge dams in country areas like Wyvanhoe Dam that Joh's National Party built, they would be all full to the brim and towns like Rocky' wouldn't have a flood crises. But gutless Labor chose to back down to the loony greenie groups too scared of losing their vote, that's how we wound up with Beatties Tugun Desal and Brizzies recyled dunny water. I hope you boofhead Labor & green voters are proud of yourselves. – KenW

RE Roadboss respect for truckies, does that include the all to common murderous drugged up tailgating ones. Get freight on rail and charge trucks true cost of road damage. but wait, big truck companies have huge political influence so logic does come in to it, right. – jk

SO now we can't get bacon in a burger at some KFCs due to muslim beliefs! What next? Wake up Australia! – Jp

PATRICK, if you don't speed, you don't get fined! Seems pretty simple to me. I'm all for increasing the number of speed cameras to catch those that break the law and endanger the lives of other people. – Jimbo

Copyright Agency Ltd (CAL) licenced copy.

HEY Spot! as a shift worker i totally agree re late nite TV. its rubbish! so i got a PVR so now wen i fin work i can watch all my favourite shows which i have set it up to record. – maxwadd

IF someone is tailgating you, you are obviously in the wrong lane. What part of keep to the left unless overtaking don't you understand? – John @ Oxenford

CRIKEY craig! Do u start ya day like that every morning? Prepare 4 the end , how about live 4 2day & thank god u r still here! – lucky

HEY craig instead of using the chatroom 2 spread your message of doom y not don a sandwich board n wander around surfers with the other loons. – mouse

TO no name, get off your high horse and stop holding the traffic up. People would not tailgate u if you just drove the speed limit. Frustrated with incompetent drivers. – Chezza

RE scottyC: if you can't trust the banks with donation $$ simply go visit one of the affected areas and spend some $$ in the local shops, have a beer and a feed, buy a paper from the local newsagency. every cent helps and you can be sure where you $$ is going.

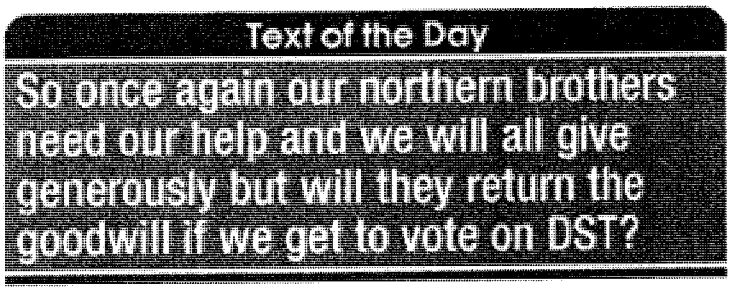
GOOD news. Bad news. Good news he says he won't run for mayor next year. Bad news we are stuck with him until then. – Southport Santa

ST port Santa. NRMA and RAQ have turned out the same adds 4 wat must b 20yrs. Time 4 a change dont u reckon. Harvey Normans up there 2.

WAT Graham Staerk wrote in the Bully 5-1-11 is spot on. Put short, our Qld politicians r useless and our future on Gold coast seems blind and way over crowded. We dont need stress, the Goldy seems 2 b losing its hearing and vision on y we chose 2 live here.

MAXWADD- the difference between your friends and my friends are that we know who we are and got ink for us not anyone else, and if you get your ink removed you should sit down and get to know themselves a bit better! So next time they make a commitment like that it is not to follow a trend! – GCHC

HARVEY Norman and the others have had it too good for too long, maybe if you were happy with just a billion dollars and giving us the best deal from your buying power we'd support you.



Copyright Agency Ltd (CAL) licenced copy.

Dan Spiller

From: [redacted]
Sent: Monday, 10 January 2011 10:23 AM
To: Carl Wulff [redacted] colin.jenser[redacted]
Cc:
Subject: FW: Wivenhoe Dam release strategy
Attachments: Technical Situation Report W37.docx

Importance: High

From: Dan Spiller
Sent: Monday, 10 January 2011 10:11 AM
Subject: Wivenhoe Dam release strategy

Carl and Rob,

Attached is the Technical Situation Report drafted by Seqwater following consultation with BoM and Councils.

Key points are:

- There is continuing heavy rainfall in catchments. Total inflows over the event will be at least 1,500,000 ML and probably above 2,100,000 ML.
- As a result, Wivenhoe Dam is above 140% of capacity and Somerset is above 150%, with both rising fast.
- As specified in the approved Operational Procedures, the primary objective is now to minimizing the risk of urban inundation (release strategy W2). This involves larger releases now, minimizing the risk of even larger releases later (were the flood compartment to reach high levels).
- Consistent with this release strategy, dam releases have increased to 2,000 cubic metres per second (172,000 ML/day). It is expected to increase to 2,600 cubic metres per second by midday tomorrow.
- As specified in the approved Operational Manual, we are targeting maximum flow in the Brisbane River of 3,500 cumecs at Moggill. This is the levels above which urban inundation begins.
- For comparison, flows would be up to 12,000 cumecs without the dams.

Seqwater has previously had verbal conversations with Council staff regarding impacts. However, given the significance of this event, and consistent with the draft protocol, we are seeking formal Council input to this version. This advice would relate to the impact of releases, based on the type of scenario analysis that you described this morning. (NO RESPONSE RECEIVED.)

Our preference would be to finalise the report by 11.00am before or at the 12.30 teleconference with Council CEOs and the BoM. This timing means that it can underpin all media messaging this afternoon.

I appreciate your assistance. Please call me if I can be of any assistance.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

D301

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

TECHNICAL SITUATION REPORT

TSR Number	W36	Date of TSR release	10.1.2011	Time of TSR release	8am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue increasing releases to discharge flood waters but keep impact downstream to minimum.	
Strategy	• All bridges are now inundated .	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Moderate to heavy rainfall has been recorded in the Upper Brisbane and Stanley Rivers in the last 12 hours with totals up to 90 mm. Totals for the last 24 hours range from 100 to 325mm.

Mt Glorious recorded 100 mm in the last 12 hours.

Rainfall of similar magnitudes is expected in the 12 to 24 hours around the downstream catchments as the system tracks south.

A severe weather warning remains current for heavy rainfall in the dam catchment areas.

North Pine Dam (Full Supply Level 39.60 m AHD)

The dam level was 39.97 m and steady. Five gates are open releasing 475 m3/s. The inflow into the dam since the commencement of the event is 52,000 ML. Estimated event volume is 72,000 ML assuming no further rainfall. Gate operations will continue until at least Tuesday 11 January 2011.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level at 05:00 was 102.84 m AHD and rising (storing 193,000 ML above FSL). Peak inflow to the dam is estimated to be about 4,200 m3/s based on observed rainfall and could be as high as 5,000m3/s with additional forecast rainfall. Five sluice gates are open releasing about 1,100m3/s (95,000Ml/d) into Wivenhoe Dam. At this stage the dam lake level will reach about 103.5 mAHD on Monday afternoon. Areas around Kilcoy will continue to be adversely affected.

Since the commencement of the event on 02/01/2011approximately 142,000ML has been released from the dam into Wivenhoe, with an event total of the order of 520,000ML expected. This is expected to increase due to the forecast rain in the next 24 to 48 hours. At this stage, releases will continue until at least Thursday.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

River levels upstream of the dam have peaked and are falling slowly with significant inflow being generated from the intense heavy rainfall. Flows in the Brisbane River at Gregor's Ck have peaked at 7,350m3/s at 23:00 on Sunday 9 January. This peak is bigger than January 1974 and February 1999 at this location.

The dam level is rising quickly, with the current level being 70.77m AHD (storing 450,000 ML). Estimated peak inflow to the dam just from the Upper Brisbane R is around 8,800m3/s and, at this stage, the dam will reach at least 73.3 m AHD during Tuesday morning. Given the rapid increase in inflow volumes, it was necessary to start to increase the release from Wivenhoe during Monday morning.

The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam and, at this stage, the aim is to keep combined flows in the lower Brisbane to 3,500m3/sec if possible. Consistent with the approved Operating Procedures, these target combined flows may need to be increased to 4,000m3/s, and potentially higher. In either case, this is significantly less than the current estimated combined pre-dam peak inflow of 12,000 m3/s.

Fernvale Bridge approaches and Mt Crosby Weir Bridge have been inundated and both bridges are now closed.

The current release rate from Wivenhoe Dam is around 2,000m3/s (172,000ML/day). Gate opening will continue to be increased during Monday and the release is expected to increase to at least 2,600m3/s in the next 12 to 24 hours and further depending on downstream flows..

Since the commencement of the event on 02/01/2011 approximately 275,000ML has been released from the dam, with an event total approaching 1,600,000ML without further rain and as much as 2,100,000ML with forecast rainfall of (both including Somerset outflow). At this stage, releases will continue until at least Sunday 16th January 2011.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Saturday 15 January in varying degrees.

Water levels in the lower Brisbane R will be impacted by the combined flows of Lockyer Ck, Bremer River, local runoff and releases from Wivenhoe Dam. If the predicted rainfall eventuates in the downstream tributary catchments the resultant combined flows in the lower Brisbane may exceed the threshold of damaging discharge in the urban areas within the next 24 to 48 hours. Currently the estimate peak flow in the lower Brisbane River will be the highest since Wivenhoe Dam was completed in 1984 but still well below flows the 1974 levels.

Somerset Regional, Ipswich City and Brisbane City Councils have been advised of the updated Wivenhoe operating strategy.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate rapidly over the next 24 hours. The flood operation centre will continue to monitor the situation and provide every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury

Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator

SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time		or Event	Change in strategy

[redacted]

From: Dan Spiller
Sent: Monday, 10 January 2011 10:28 AM
To: Reilly Bob
Subject: Teleconference details

Categories: T8

Bob, details below.

Please forward a copy of this appointment to anyone who needs to participate in the teleconference.

You will need to use the following numbers to join this teleconference:

Telephone Number: [redacted]

A/C & Pin:

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

Subject:	Dam release briefing for Minister
Location:	Minister's office, Level 17, Albert Street
Start:	Mon 10/01/2011 10:30 AM
End:	Mon 10/01/2011 11:00 AM
Show Time As:	Tentative
Recurrence:	(none)
Meeting Status:	Not yet responded
Organizer:	Dan Spiller
Required Attendees:	Barry Dennien; pborrows[redacted]Best Debbie;[redacted]
Categories:	T8

[redacted]

From: SEQWGM Media
Sent: Monday, 10 January 2011 10:42 AM
Subject: Media update - Dam releases - 10 January 2011

Categories: T8

Media update – 10 January 2011

Dam releases

Significant rainfall across the catchments has lifted Wivenhoe Dam's level to above 140 per cent and Somerset Dam to above 150 per cent.

Although releases are being made, large quantities of water continue to flow into the dams and are being held back in order to manage impacts downstream and allow for other inflows from urban runoff, the Lockyer and Bremer Rivers to subside.

Overnight, Fernvale and Mt Crosby Weir Bridges together with a number of local roads became inundated. They joined the others already impacted, including Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing.

In order to relieve the quickly filling flood storage compartment, and with more rain forecast, controlled releases from the dam have been increased today from 116,000 megalitres per day to 170,000 megalitres per day. These releases are a necessity.

Releases are being reviewed in consultation with the Bureau of Meteorology and local councils, utilising a strategy to limit impacts where possible downstream.

Water from Somerset Dam is being released into Wivenhoe Dam through the sluice gates.

Spillway gate operations are continuing at North Pine Dam, with all five gates open. These releases may continue until next week, depending upon further rainfall.

At Leslie Harrison Dam, gate releases are underway. A minor release of around 1200 megalitres a day is being made through the emergency gates of Hinze Dam.

The Water Grid is working with local councils regarding the current releases and the likely impacts, which are being managed in accordance with approved flood management plans.

For further information on dam releases please visit www.watergrid.com.au.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

Recreation update

Due to water levels, both Wivenhoe and Somerset are closed to all recreational activities, and will remain so for some days.

The following recreation sites are closed –

- O'Sheas Crossing
- Hamon Cove
- Logan Inlet
- Captain Logan Camp
- Lumley Hill
- Spillway Common/ Atkinson's Crossing
- Cormorant Bay
- Branch Creek
- Billies Bay/Hays Landing
- The Spit
- Lake Somerset Holiday Park Kirkleagh

Numerous roads are cut including the highway at Kilcoy and Fernvale, and conditions are extremely dangerous.

Moogerah and Maroon Dam remains open, however, swimming and skiing should be avoiding.

Access to Borumba Dam is currently not available as Yabba Creek Road between Imbil and Borumba Dam is closed.

Lake Baroon has also been closed to all water based recreational activities but is open for picnics and barbeques. Care should be taken at the recreation sites, and vehicles must be parked in designated parking areas only.

Visitors should check the Water Grid website (www.watergrid.com.au) for additional information for each recreation site.

Gold Coast Desalination Plant

Even though the regions dams are at or near full capacity, recent heavy rains have resulted in high sediment levels in the Brisbane River. These increased levels may present challenges for water treatment plants like those at Mt Crosby, which are the main supply for Brisbane.

The Gold Coast Desalination facility was recently brought up to full capacity to address the flood associated issues at Mt Crosby without compromising water security or quality for Brisbane.

With Mt Crosby now back to normal the Gold Coast Desalination facility has now been reduced to 33 per cent capacity.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: [redacted]
Sent: Monday, 10 January 2011 10:54 AM
To: Dan Spiller
Subject: contact details for BCC re water effects

Categories: T8

Dan

As per our conversation my email is attached and any further info will be great

Regards [redacted]

****
CONFIDENTIALITY: The information contained in this electronic mail message and any electronic files attached to it may be confidential information, and may also be the subject of legal professional privilege and/or public interest immunity. If you are not the intended recipient you are required to delete it. Any use, disclosure or copying of this message and any attachments is unauthorised. If you have received this electronic message in error, please form the sender or contact securityscanner@police.qld.gov.au. his footnote also confirms that this email message has been checked for the presence of computer viruses.
****

[redacted]

From: Dan Spiller
Sent: Monday, 10 January 2011 11:10 AM
To: 'Rob Drury'; [redacted]
Subject: FW: contact details for BCC re water effects

Categories: T8

Guys,

Can you please provide Greg the details of the people that you have been speaking to in BCC?

Thanks,
Dan

From: [redacted]
Sent: Monday, January 10, 2011 10:54 AM
To: Dan Spiller
Subject: contact details for BCC re water effects

Dan

As per our conversation my email is attached and any further info will be great

Regards [redacted]

****
CONFIDENTIALITY: The information contained in this electronic mail message and any electronic files attached to it may be confidential information, and may also be the subject of legal professional privilege and/or public interest immunity. If you are not the intended recipient you are required to delete it. Any use, disclosure or copying of this message and any attachments is unauthorised. If you have received this electronic message in error, please inform the sender or contact securityscanner@police.qld.gov.au. This footnote also confirms that this email message has been checked for the presence of computer viruses.
****

[redacted]

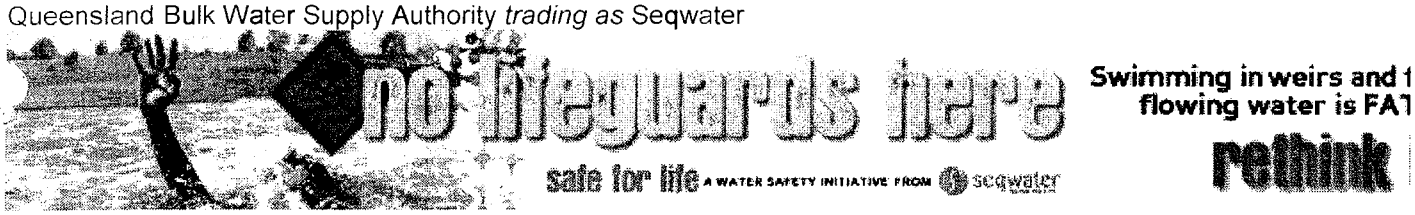
From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 11:29 AM
To: Dan Spiller; [redacted]
Subject: RE: contact details for BCC re water effects

Categories: T8

Sent email to Chris Lavin of BCC for him to advise Police direct just to make sure he is okay with providing details and that they are the right people.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Dan Spiller [redacted]
Sent: Monday, 10 January 2011 11:10 AM
To: Rob Drury [redacted]
Subject: FW: contact details for BCC re water effects

Guys,

Can you please provide Greg the details of the people that you have been speaking to in BCC?

Thanks,
Dan

From [redacted]
Sent: Monday, January 10, 2011 10:54 AM
To: Dan Spiller
Subject: contact details for BCC re water effects

Dan

As per our conversation my email is attached and any further info will be great

Regards [redacted]

****
CONFIDENTIALITY: The information contained in this electronic mail message and any electronic files attached to it may be confidential information, and may also be the subject of legal professional privilege and/or public interest immunity. If you are not the intended recipient you are required to delete it. Any use, disclosure or copying of this message and any attachments is unauthorised. If you have received this electronic message in error, please inform the sender or contact securityscanner@police.qld.gov.au. This footnote also confirms that this email message has been checked for the presence of computer viruses.
****

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may ontain confidential and/or privileged information. If you are not the addressee, you are notified that any ransmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: [redacted]
Sent: Monday, 10 January 2011 12:00 PM
To: Dan Spiller
Subject: [redacted] Chanel 7 returned your call

Categories: T8

[redacted]

From: [redacted]
Sent: Monday, 10 January 2011 2:12 PM
To: [redacted] Barry Dennien; Dan Spiller; [redacted] Mike Foster [redacted]
Cc:
Subject: RE: Release Update

Categories: T8

Hi Paul

Thanks for the update. As discussed, we are waiting on further modelling results regarding river levels and predicted flood impacts. We will hold off on drafting our afternoon update until these details are received.

Regards

[redacted]

Senior Media Advisor
SEQ Water Grid Communications Unit
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.



From [redacted]
Sent: Monday, 10 January 2011 1:55 PM
To: SEQWGM Media; Reception; [redacted] Barry Dennien; Dan Spiller; [redacted] Mike Foster [redacted]
Cc: [redacted]
Subject: Release Update

As at 1.00 pm on Monday 10 January, the following applies:

SOMERSET DAM:
As a result of rainfall and inflows, water is being released into Wivenhoe through five sluice gates at about 95,000 megalitres per day and is likely to continue until Thursday 13 January. Areas around Kilcoy are likely to be impacted as a result of the rising dam levels.

WIVENHOE DAM:

Upstream levels are rising quickly as a result of significant heavy rainfall. The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam.

Gate Releases of around 170,000 megalitres a day are underway and are likely to increase due ongoing inflows and predicted rainfall and are to continue until at least Sunday 16 January.

Local Councils have been advised that as a result of Lockyer Creek flows, local runoff and Wivenhoe releases, Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge Colleges Crossing, Fernvale Bridge, and Mt Crosby Weir Bridge may be inundated until at least the weekend.

NORTH PINE DAM:
Five gates are open, releasing around 43,000 megalitres a day and will continue until at least Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

LESLIE HARRISON DAM:

Gate releases are underway due to rainfall and inflows.

HINZE DAM:
A minor release of around 1200 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

For detailed information on road crossing closures and other potential impacts, always contact your local council.

RECREATION UPDATE:

Both Wivenhoe and Somerset are closed to all recreational activities, and will remain so for some days.

The following recreation sites are closed –

- O'Sheas Crossing
- Hamon Cove
- Logan Inlet
- Captain Logan Camp
- Lumley Hill
- Spillway Common/ Atkinson's Crossing
- Cormorant Bay
- Branch Creek
- Billies Bay/Hays Landing
- The Spit
- Lake Somerset Holiday Park Kirkleagh

Numerous roads are cut including the highway at Kilcoy and Fernvale, and conditions are extremely dangerous.

This information will be updated during the afternoon of Monday 10 January.

[redacted]
Senior Communications Advisor
Queensland Bulk Water Supply Authority *trading as* Seqwater

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au



Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Ken Smith [redacted]
Sent: Monday, 10 January 2011 2:13 PM
To: Dan Spiller; [redacted]
'debbie.best [redacted]
Cc: Barry Dennien; [redacted]
Subject: Re: BCC communications update

Categories: T8

Thanks Dan

[redacted]

From: Dan Spiller [redacted]
To: [redacted] Ken Smith; Best Debbie < [redacted] >
Cc: Barry Dennien [redacted]
Sent: Mon Jan 10 13:42:29 2011
Subject: BCC communications update

For information, BCC communications had scheduled a media conference with the Deputy Mayor at 2pm.

BCC just confirmed that they are seeking to cancel this conference, pending ongoing discussions between the Premier and Mayor.

Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email is intended only for the addressee. Its use is limited to that intended by the author at the time and it is not
to be distributed without the author's consent.

Unless otherwise stated, the State of Queensland accepts no liability for the contents of this email except where
subsequently confirmed in writing. The opinions expressed in this email are those of the author and do not necessarily
represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.

[redacted]

From: [redacted]
Sent: Monday, 10 January 2011 3:01 PM
To: [redacted]
Subject: MEDIA RELEASE: Brisbane on flood alert for next fortnight
Attachments: 1001 Flood_preparednessNEWMAN.doc

Brisbane on flood alert for next fortnight

Lord Mayor Campbell Newman has warned property owners along the Brisbane River and suburban creeks of the potential for increased flooding over the next fortnight.

Cr Newman said the combination of heavy rain, necessary releases from Wivenhoe Dam, and higher than usual tides, meant the Brisbane River could rise significantly.

The biggest impacts could be felt on Wednesday (January 12) and Friday week (January 21).

More attached.

[redacted]
Media Adviser
Office of the Lord Mayor & Cabinet

Postal:
GPO Box 2287
Brisbane Qld 4001

[redacted]

Campbell Newman

Lord Mayor

MEDIA RELEASE

Brisbane on flood alert for next fortnight

Lord Mayor Campbell Newman has warned property owners along the Brisbane River and suburban creeks of the potential for increased flooding over the next fortnight.

Cr Newman said the combination of heavy rain, necessary releases from Wivenhoe Dam, and higher than usual tides, meant the Brisbane River could rise significantly.

The biggest impacts could be felt on Wednesday (January 12) and Friday week (January 21).

The Lord Mayor said Council had modelled water patterns using information from SEQ Water, the State Government and the Bureau of Meteorology.

"This is currently the projected worst case scenario for the next few days, and I hope it doesn't happen, but people need to be forewarned so they can prepare themselves for flooding," he said.

"Our flood modelling shows river levels will be high on Wednesday (January 12) and particularly high on Friday week (January 21) due to the influence of a king tide."

The Lord Mayor said Council officers began contacting residents and businesses in affected areas today to warn them of the potential of flooding in catchment areas around the Brisbane River.

There was also the potential for localised flooding in areas with heavy rainfall.

Cr Newman said Council had activated the Local Disaster Coordination Centre. Sandbags were available for residents at Council depots in Darra, Morningside, Zillmere and Newmarket.

Cr Newman said by early this morning Wivenhoe Dam was at 140 per cent capacity and rising fast.

He said the dam had the potential to go to over 200 per cent capacity before overflowing, however there was as much water flowing into the dam, and in some cases more, than the Brisbane River saw in this location in the 1974 floods.

"Wivenhoe Dam is doing its job, but it cannot fully protect us from flooding because of significant inflows into the Brisbane River, as well as water from the Bremer River and Lockyer Creek.

The Lord Mayor urged residents to contact Council on 3403 8888 to report issues outside their property boundary such as flooding, downed trees, potholes, stormwater drain blockages or debris blocking roadways. For life-threatening emergencies, phone 000.

Residents can be better prepared for storms and flooding by getting a FloodWise Property Report and downloading the Flood Flag Map for their suburb and by signing up to the Early Warning Alert Service. These services are available for free on council's website.

For more information on preparing for severe weather, go to www.brisbane.qld.gov.au/floodwise.

[Ends] January 10, 2011

Media contact: [redacted]

Delivering for our suburbs

Litsupport Brisbane

From: [redacted]
Sent: Monday, 10 January 2011 3:11 PM
To: Barry Dennien; Dan Spiller; [redacted]
Subject: FW: FOC Situation Report at 12:00 on Monday 10 January 2011

For your information, please find below the FOC Situation report sent at 3.00 pm today.

Kindest regards

[redacted]
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

From: [redacted]
Sent: Monday, 10 January 2011 3:05 PM
To: [redacted]
Subject: FW: FOC Situation Report at 12:00 on Monday 10 January 2011

From: Duty Engineer [redacted]
Sent: Monday, 10 January 2011 14:58
To: Duty Seq; [redacted] Mike Foster; [redacted] Peter Allen; Rob Drury; [redacted] Bill Stephens; [redacted] John.Ruffini [redacted] John Tibaldi; Rob.ayre [redacted] Terry Malone; Brett Schultz [redacted]
Cc: [redacted] Mailbox; Tony Trace; Chris Lavin; [redacted] James Charalambous; Ken Morris; [redacted] Peter Borrows
Subject: RE: FOC Situation Report at 12:00 on Monday 10 January 2011

Rainfall

Significant rainfall has fallen in the Wivenhoe Dam catchment over the last 3 hours, with falls exceeding 100mm. This rainfall will significantly increase inflows into the dam. A severe weather warning remains current for heavy rainfall in the dam catchment areas. The QPF issued by BOM at 10:00 estimates rainfalls for the 24 hours to 10:00 Tuesday as North Pine Dam (75mm to 150mm); Wivenhoe/Somerset Dam Catchments (50mm – 100mm). Potentially significant rain moving towards the dam catchments is currently evident on the BOM radar.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 103.41m AHD and rising. Peak inflow to the dam is estimated to be about 4,200 m3/s. Five sluice gates are open releasing about 1,100m3/s (95,000ML/day) into Wivenhoe Dam. At this stage the dam lake level will reach about 103.5m AHD on Monday afternoon. Areas around Kilcoy will continue to be adversely affected.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

The dam level is 72.41m AHD and rising quickly. The rainfall experienced over the last 2 to 3 hours will result in significant further inflows into the dam and releases from the dam will need to be increased in accordance with Flood Mitigation procedures and to ensure that a fuse plug is not initiated. The initiation of a fuse plug will result in a rapid uncontrolled outflow from the dam of 2,000m3/s being added to the gate release outflow. Outflows into the Brisbane River from both Lockyer Creek and the Bremer River are also increasing.

Five radial gates are currently open at the dam releasing about 2,000m3/s into the Brisbane River and this will need to be increased steadily to an outflow of 2,800m3/s over the next 9 hours (commencing at 1500). At this stage, the dam will reach about 73.8m AHD during Tuesday morning.

The objective for dam operations is currently to minimise the impact of urban flooding in areas downstream of the dam and to keep river flows in the lower Brisbane River below 4,000m3/s if possible. This is significantly less than the current estimated combined pre-dam peak inflow of 12,000m3/s. If further rainfall occurs, dam releases may need to be increased further and this may result in river flows in the lower Brisbane River approaching or exceeding 5,000m3/s.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer Creek flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Sunday 16 January in varying degrees.

Water levels in the lower Brisbane River will be impacted by the combined flows of Lockyer Creek, Bremer River, local runoff and releases from Wivenhoe Dam.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate rapidly over the next 24 hours. The flood operation centre will continue to monitor the situation and provide every six hours until the situation stabilizes.

Terry Malone
Duty Engineer
Flood Operations Centre

Phon [redacted]

Fax:

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to

this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Litsupport Brisbane

From: John Adcock
Sent: Monday, 10 January 2011 3:15 PM
To: [redacted] Dan Spiller
Subject: FW: Seqwater assistance to councils for residents stranded/cut off by Wivenhoe gate releases etc

[redacted]nd Dan

I've spoken with Tony Jacobs re: assistance. He will discuss with CEO and Mayor and get back. His initial response was thanks but no thanks as residents who chose to live in areas prone to isolation due Wivenhoe and other flooding do so at their own risk.

Currently resupply can only be made via helicopter (organised via EMQ) and given state disaster declaration cost is covered by state government.

Regards
John

From: [redacted] **On Behalf Of** Dan Spiller
Sent: Monday, 10 January 2011 3:01 PM
To: John Adcock
Subject: FW: Seqwater assistance to councils for residents stranded/cut off by Wivenhoe gate releases etc

---

From: Reilly Bob [redacted]
Sent: Friday, 7 January 2011 10:02 AM
To: Mike Foster; Dan Spiller
Cc: Peter Borrows; [redacted]; [redacted] Rob Drury; [redacted]
Subject: RE: Seqwater assistance to councils for residents stranded/cut off by Wivenhoe gate releases etc

Hi everyone

My comments are:

- I suggest it is made clear to Council (and residents) that we are only talking about assistance when the floodgates are operating.
- In terms of the number of days—it might be worth talking to EMQ about a reasonable figure based on their experience in flood events—I suspect it might be more around the 5 rather than three days mark ([particularly if residents have prior notification of the event), but I would be guided by what they say

Regards

Bob

From: Mike Foster [redacted]
Sent: Friday, 7 January 2011 9:47 AM

To: spiller daniel [redacted] Reilly Bob
Cc: Peter Borrows; [redacted] Rob Drury; [redacted]
Subject: Seqwater assistance to councils for residents stranded/cut off by Wivenhoe gate releases etc

Dan,

As per your discussions with Bob Reilly, Peter B is comfortable for the Water Grid to make the offer on behalf of Seqwater – letter via John Adcock channels is the way to go.

Peter is keen to ensure the flavour of the letter is

- offer is to cover reasonable costs associated with assistance of stranded residents, with the council to provide an estimate prior to incurring the cost where possible as well as a description of services provided. (A pre agreed level of service may be the best approach).
- Service costs covered to include council expenses to access stranded residents (boats etc) as well as supplies required
- Offer would kick in from when council decides they are required to assist – with an understanding that in most cases it would be for residents stranded for more than xxx days (more than 3 or 5 days???)
- The responsibility for delivering the service remains with Council.

Bob R may also have some suggestions for the letter of offer, particularly around when assistance kicks in.

Peter agrees that it is more appropriate for the offer to come out from the Water Grid on behalf of Seqwater.

If you can send through copy of final letter for review that'd be greatly appreciated.

Cheers Mike

Mike Foster
Manager Strategic Relations & Communication
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

Litsupport Brisbane

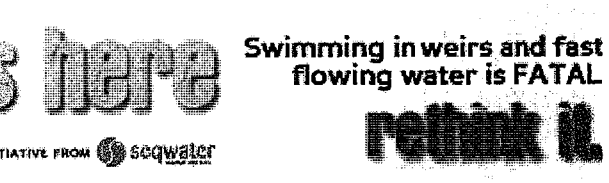
From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 3:16 PM
To: Rob Drury; Dan Spiller [redacted] Peter Borrows; Peter.Allen [redacted]
Subject: RE: Technical Report W37
Attachments: Technical Situation Report W37.docx

Report W37 attached.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater





seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

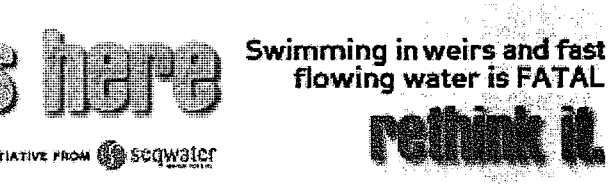
From: Rob Drury
Sent: Monday, 10 January 2011 8:06 AM
To: Rob Drury; 'Daniel.Spiller [redacted] Peter Borrows; 'Peter.Aller [redacted]
Subject: RE: Technical Report W36

Please disregard the previous report, it was based on older information, this is the latest update.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater





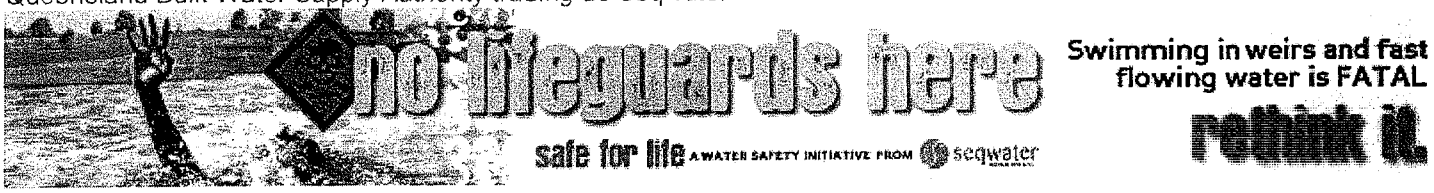
[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Monday, 10 January 2011 7:53 AM
To: Rob Drury; 'Daniel Spille[redacted] Barry Dennie[redacted]
'media[redacted] debbie.best[redacted]
Peter Borrows; 'Peter.Allen[redacted]
Subject: RE: Technical Report W35

Attached report W35.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W37	Date of TSR release	10.1.2011	Time of TSR release	3pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue increasing releases to discharge flood waters but keep impact downstream to minimum.	
Strategy	• All bridges are now inundated . • Ramp up to 2800cumecs which will give a flow in the lower Brisbane River of around 4,000cumecs	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Significant rainfall has fallen in the Wivenhoe Dam catchment over the last 3 hours, with falls exceeding 100mm. This rainfall will significantly increase inflows into the dam. A severe weather warning remains current for heavy rainfall in the dam catchment areas. The QPF issued by BOM at 10:00 estimates rainfalls for the 24 hours to 10:00 Tuesday as North Pine Dam (75mm to 150mm); Wivenhoe/Somerset Dam Catchments (50mm – 100mm). Potentially significant rain moving towards the dam catchments is currently evident on the BOM radar.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 103.41m AHD and rising. Peak inflow to the dam is estimated to be about 4,200 m3/s. Five sluice gates are open releasing about 1,100m3/s (95,000ML/day) into Wivenhoe Dam. At this stage the dam lake level will reach about 103.5m AHD on Monday afternoon. Areas around Kilcoy will continue to be adversely affected.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

The dam level is 72.41m AHD and rising quickly. The rainfall experienced over the last 2 to 3 hours will result in significant further inflows into the dam and releases from the dam will need to be increased in accordance with Flood Mitigation procedures and to ensure that a fuse plug is not initiated. The initiation of a fuse plug will result in a rapid uncontrolled outflow from the dam of 2,000m3/s being added to the gate release outflow. Outflows into the Brisbane River from both Lockyer Creek and the Bremer River are also increasing.

Five radial gates are currently open at the dam releasing about 2,000m3/s into the Brisbane River and

this will need to be increased steadily to an outflow of 2,800m3/s over the next 9 hours (commencing at 1500). At this stage, the dam will reach about 73.8m AHD during Tuesday morning.

The objective for dam operations is currently to minimise the impact of urban flooding in areas downstream of the dam and to keep river flows in the lower Brisbane River below 4,000m3/s if possible. This is significantly less than the current estimated combined pre-dam peak inflow of 12,000m3/s. If further rainfall occurs, dam releases may need to be increased further and this may result in river flows in the lower Brisbane River approaching or exceeding 5,000m3/s.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer Creek flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Sunday 16 January in varying degrees.

Water levels in the lower Brisbane River will be impacted by the combined flows of Lockyer Creek, Bremer River, local runoff and releases from Wivenhoe Dam.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate rapidly over the next 24 hours. The flood operation centre will continue to monitor the situation and provide every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time		or Event	Change in strategy

[redacted]

From: [redacted]
Sent: Monday, 10 January 2011 3:19 PM
To: Barry Dennien; Dan Spiller; [redacted] SEQWGM Communications Staff
Subject: FW: MEDIA RELEASE: Brisbane on flood alert for next fortnight
Attachments: MEDIA RELEASE Brisbane on flood alert for next fortnight

Categories: T8

Hi Barry Hi Dan - Please see attached the Lord Mayors press release

Kindest regards
[redacted]

-----Original Message-----
From: [redacted]
Sent: Monday, 10 January 2011 3:16 PM
To: SEQWGM Media
Subject: FW: MEDIA RELEASE: Brisbane on flood alert for next fortnight

FYI

[redacted]
News | Brisbane

Seven Network (Operations) Limited

Sir Samuel Griffith Drive | Mt Coot-tha | Brisbane QLD 4066
Australia

Postal Address: GPO Box 604 | Brisbane QLD 4001 Australia

[redacted]

-----Original Message-----
[redacted]
Sent: Monday, 10 January 2011 3:03 PM
To: [redacted]
Subject: Fw: MEDIA RELEASE: Brisbane on flood alert for next fortnight

Here's the release
****

This message has passed through an insecure network.
Please direct all enquiries to the message author.
****

##########

Important Notice:

This message and its attachments are confidential and may contain information which is protected by copyright. It is intended solely for the named addressee. If you are not the authorised recipient (or responsible for delivery of the message to the authorised recipient), you must not use, disclose, print, copy or deliver this message or its attachments to anyone. If you receive this email in error, please contact the sender immediately and permanently delete this message and its attachments from your system.
Any content of this message and its attachments that does not relate to the official business of Seven Network Limited or its subsidiaries must be taken not to have been sent or endorsed by any of them. No representation is made that this email or its attachments are without defect or that the contents express views other than those of the sender.

##########

Campbell Newman

Lord Mayor

MEDIA RELEASE

Brisbane on flood alert for next fortnight

Lord Mayor Campbell Newman has warned property owners along the Brisbane River and suburban creeks of the potential for increased flooding over the next fortnight.

Cr Newman said the combination of heavy rain, necessary releases from Wivenhoe Dam, and higher than usual tides, meant the Brisbane River could rise significantly.

The biggest impacts could be felt on Wednesday (January 12) and Friday week (January 21).

The Lord Mayor said Council had modelled water patterns using information from SEQ Water, the State Government and the Bureau of Meteorology.

"This is currently the projected worst case scenario for the next few days, and I hope it doesn't happen, but people need to be forewarned so they can prepare themselves for flooding," he said.

"Our flood modelling shows river levels will be high on Wednesday (January 12) and particularly high on Friday week (January 21) due to the influence of a king tide."

The Lord Mayor said Council officers began contacting residents and businesses in affected areas today to warn them of the potential of flooding in catchment areas around the Brisbane River.

There was also the potential for localised flooding in areas with heavy rainfall.

Cr Newman said Council had activated the Local Disaster Coordination Centre. Sandbags were available for residents at Council depots in Darra, Morningside, Zillmere and Newmarket.

Cr Newman said by early this morning Wivenhoe Dam was at 140 per cent capacity and rising fast.

He said the dam had the potential to go to over 200 per cent capacity before overflowing, however there was as much water flowing into the dam, and in some cases more, than the Brisbane River saw in this location in the 1974 floods.

"Wivenhoe Dam is doing its job, but it cannot fully protect us from flooding because of significant inflows into the Brisbane River, as well as water from the Bremer River and Lockyer Creek.

The Lord Mayor urged residents to contact Council on 3403 8888 to report issues outside their property boundary such as flooding, downed trees, potholes, stormwater drain blockages or debris blocking roadways. For life-threatening emergencies, phone 000.

Residents can be better prepared for storms and flooding by getting a FloodWise Property Report and downloading the Flood Flag Map for their suburb and by signing up to the Early Warning Alert Service. These services are available for free on council's website.

For more information on preparing for severe weather, go to www.brisbane.qld.gov.au/floodwise.

[Ends] January 10, 2011

Media contact: [redacted]

[redacted]

From: Dan Spiller
Sent: Monday, 10 January 2011 4:09 PM
To: Barry Dennien
Subject: Technical Situation Report W37
Attachments: Technical Situation Report W37.docx

Categories: T8

TECHNICAL SITUATION REPORT

TSR Number	W37	Date of TSR release	10.1.2011	Time of TSR release	3pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue increasing releases to discharge flood waters but keep impact downstream to minimum.	
Strategy	• All bridges are now inundated . • Ramp up to 2800cumecs which will give a flow in the lower Brisbane River of around 4,000cumecs	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Significant rainfall has fallen in the Wivenhoe Dam catchment over the last 3 hours, with falls exceeding 100mm. This rainfall will significantly increase inflows into the dam. A severe weather warning remains current for heavy rainfall in the dam catchment areas. The QPF issued by BOM at 10:00 estimates rainfalls for the 24 hours to 10:00 Tuesday as North Pine Dam (75mm to 150mm); Wivenhoe/Somerset Dam Catchments (50mm – 100mm). Potentially significant rain moving towards the dam catchments is currently evident on the BOM radar.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 103.41m AHD and rising. Peak inflow to the dam is estimated to be about 4,200 m3/s. Five sluice gates are open releasing about 1,100m3/s (95,000ML/day) into Wivenhoe Dam. At this stage the dam lake level will reach about 103.5m AHD on Monday afternoon. Areas around Kilcoy will continue to be adversely affected.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

The dam level is 72.41m AHD and rising quickly. The rainfall experienced over the last 2 to 3 hours will result in significant further inflows into the dam and releases from the dam will need to be increased in accordance with Flood Mitigation procedures and to ensure that a fuse plug is not initiated. The initiation of a fuse plug will result in a rapid uncontrolled outflow from the dam of 2,000m3/s being added to the gate release outflow. Outflows into the Brisbane River from both Lockyer Creek and the Bremer River are also increasing.

Five radial gates are currently open at the dam releasing about 2,000m3/s into the Brisbane River and

this will need to be increased steadily to an outflow of 2,800m3/s over the next 9 hours (commencing at 1500). At this stage, the dam will reach about 73.8m AHD during Tuesday morning.

The objective for dam operations is currently to minimise the impact of urban flooding in areas downstream of the dam and to keep river flows in the lower Brisbane River below 4,000m3/s if possible. This is significantly less than the current estimated combined pre-dam peak inflow of 12,000m3/s. If further rainfall occurs, dam releases may need to be increased further and this may result in river flows in the lower Brisbane River approaching or exceeding 5,000m3/s.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer Creek flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Sunday 16 January in varying degrees.

Water levels in the lower Brisbane River will be impacted by the combined flows of Lockyer Creek, Bremer River, local runoff and releases from Wivenhoe Dam.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate rapidly over the next 24 hours. The flood operation centre will continue to monitor the situation and provide every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	[redacted]	11.1.2011	[redacted]	[redacted]	Change in strategy

[redacted]

From: Barry Dennien
Sent: Monday, 10 January 2011 4:11 PM
To: Peter Baddiley [redacted]
Cc: Dan Spiller
Subject: Tech report
Attachments: Technical Situation Report W37.docx

Categories: T8

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
Phone [redacted]
Email:
Visit: Level 15, 53 Albert Street, Brisbane
ost: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

TECHNICAL SITUATION REPORT

TSR Number	W37	Date of TSR release	10.1.2011	Time of TSR release	3pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue increasing releases to discharge flood waters but keep impact downstream to minimum.	
Strategy	• All bridges are now inundated . • Ramp up to 2800cumecs which will give a flow in the lower Brisbane River of around 4,000cumecs	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Significant rainfall has fallen in the Wivenhoe Dam catchment over the last 3 hours, with falls exceeding 100mm. This rainfall will significantly increase inflows into the dam. A severe weather warning remains current for heavy rainfall in the dam catchment areas. The QPF issued by BOM at 10:00 estimates rainfalls for the 24 hours to 10:00 Tuesday as North Pine Dam (75mm to 150mm); Wivenhoe/Somerset Dam Catchments (50mm – 100mm). Potentially significant rain moving towards the dam catchments is currently evident on the BOM radar.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 103.41m AHD and rising. Peak inflow to the dam is estimated to be about 4,200 m3/s. Five sluice gates are open releasing about 1,100m3/s (95,000ML/day) into Wivenhoe Dam. At this stage the dam lake level will reach about 103.5m AHD on Monday afternoon. Areas around Kilcoy will continue to be adversely affected.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

The dam level is 72.41m AHD and rising quickly. The rainfall experienced over the last 2 to 3 hours will result in significant further inflows into the dam and releases from the dam will need to be increased in accordance with Flood Mitigation procedures and to ensure that a fuse plug is not initiated. The initiation of a fuse plug will result in a rapid uncontrolled outflow from the dam of 2,000m3/s being added to the gate release outflow. Outflows into the Brisbane River from both Lockyer Creek and the Bremer River are also increasing.

Five radial gates are currently open at the dam releasing about 2,000m3/s into the Brisbane River and

this will need to be increased steadily to an outflow of 2,800m3/s over the next 9 hours (commencing at 1500). At this stage, the dam will reach about 73.8m AHD during Tuesday morning.

The objective for dam operations is currently to minimise the impact of urban flooding in areas downstream of the dam and to keep river flows in the lower Brisbane River below 4,000m3/s if possible. This is significantly less than the current estimated combined pre-dam peak inflow of 12,000m3/s. If further rainfall occurs, dam releases may need to be increased further and this may result in river flows in the lower Brisbane River approaching or exceeding 5,000m3/s.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer Creek flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Sunday 16 January in varying degrees.

Water levels in the lower Brisbane River will be impacted by the combined flows of Lockyer Creek, Bremer River, local runoff and releases from Wivenhoe Dam.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate rapidly over the next 24 hours. The flood operation centre will continue to monitor the situation and provide every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	[redacted]	11.1.2011	[redacted]	[redacted]	Change in strategy

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 4:24 PM
To: Barry Dennien; Dan Spiller
Cc: Peter Borrows
Subject: FW: FLDWARN for Lower Brisbane and Bremer Rs [SEC=UNCLASSIFIED]

Attached is the BoM warning re levels that they develop in discussion with our FOC re releases and models and then they discuss with BCC.

This is what they then provide to everyone.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority trading as Seqwater

[redacted] Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia PO Box 37, Fernvale QLD 4306 Website | www.seqwater.com.au

-----Original Message-----
From: weather
Sent: Monday, 10 January 2011 4:17 PM
To: DG-Ops Dam Levels; [redacted]
Subject: FW: FLDWARN for Lower Brisbane and Bremer Rs [SEC=UNCLASSIFIED]

From: Aifs Operational Manager [redacted]
Sent: Monday, January 10, 2011 4:16:39 PM
To: weather
Subject: BOM: FLDWARN for Lower Brisbane and Bremer Rs [SEC=UNCLASSIFIED]
Auto forwarded by a Rule

TO::BOM615

IDQ20805

Australian Government Bureau of Meteorology
Queensland

PRIORITY
FLOOD WARNING FOR THE LOCKYER, BREMER, WARRILL AND BRISBANE RIVER BELOW WIVENHOE INCLUDING BRISBANE CITY
Issued at 4:16 PM on Monday the 10th of January 2011
by the Bureau of Meteorology, Brisbane.

Stream level rises causing moderate to major flooding are being recorded in Lockyer Creek, Warrill Creek and and along the Bremer River. Major flood levels are likely at Ipswich during Tuesday.

Wivenhoe dam is providing significant mitigation of upper Brisbane floods. River flows from the Bremer and Lockyer catchments combined with releases from Wivenhoe dam are expected to increase levels in Brisbane overnight and through Tuesday.

At the Brisbane City Gauge, a river levels of about 2.1 metres is expected with the afternoon high tide on Tuesday and about 3 metres is expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

LOCKYER CREEK:
Further rainfall during Monday has led to renewed rises in the Lockyer Creek catchment. Rainfall is forecast to continue this evening and a return to moderate to major flood levels is expected overnight and during Tuesday. Major flood levels are expected to continue at Lyons Bridge with rises above 15 metres likely during Tuesday.

BREMER RIVER:
Rainfall during Monday will lead to renewed rises and a return to moderate flood levels along the Bremer River to Walloon. Levels over 5 metres are expected at Rosewood overnight.

The Bremer River at Ipswich is expected to reach about 12.7 metres on Tuesday afternoon. Higher levels are possible.

WARRILL CREEK
Further rainfall during Monday will lead to increasing river levels along Warrill Creek with levels expected to reach above 6 metres at Amberley overnight.

MIDDLE AND LOWER BRISBANE:
SEQwater advises releases from Wivenhoe Dam will increase during Monday. Moderate flooding is expected at Savages Crossing and at Mt Crosby Weir overnight tonight and during Tuesday.

The Brisbane River at the City Gauge (lower end of Edward Street and at Thornton Street) is expected to reach about 2.1 metres with the afternoon high tide on Tuesday and reach about 3 metres with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Predicted River Heights/Flows:
Ipswich: Reach about 12.7 metres (major) during Tuesday afternoon. Quicker rises and higher levels are possible depending on further rainfall tonight.

Moggill: Reach about 12 metres (minor) during Tuesday afternoon.

Jindalee: Reach about 7 metres (minor) overnight Tuesday.

Brisbane: Reach about 2.1 metres with the afternoon high tide on Tuesday.
Reach about 3 metres with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Further rises are possible at all four locations depending on further rain.

Next Issue:
The next warning will be issued at about 9pm Monday.

Latest River Heights:

Lockyer Ck at Gatton #	10.36m steady	03:04 PM MON 10/01/11
Laidley Ck at Laidley	6m rising	02:45 PM MON 10/01/11
Laidley Ck at Showground Weir #	6.98m rising	03:07 PM MON 10/01/11
Laidley Ck at Warrego Hwy *	5.43m falling	01:00 PM MON 10/01/11
Lockyer Ck at Glenore Grove #	11.36m falling	03:05 PM MON 10/01/11
Lockyer Ck at Lyons Br #	14.79m rising	03:02 PM MON 10/01/11
Lockyer Ck at Rifle Range Rd *	13.4m rising	08:20 AM MON 10/01/11
Brisbane R at Lowood Pump Stn #	14.13m falling	03:07 PM MON 10/01/11
Brisbane R at Savages Crossing #	14.15m rising	03:09 PM MON 10/01/11
Brisbane R at Burtons Br #	10.88m rising	03:05 PM MON 10/01/11
Brisbane R at Kholo Br #	6.23m rising	03:06 PM MON 10/01/11
Brisbane R at Mt Crosby #	14.26m rising	03:07 PM MON 10/01/11
Brisbane R at Colleges Crossing #	11.96m rising	03:09 PM MON 10/01/11
Bremer R at Spressers Br #	5.07m rising	03:09 PM MON 10/01/11
Bremer R at Rosewood #	4.94m rising	03:02 PM MON 10/01/11
Bremer R at Five Mile Br Walloon #	5.12m falling	03:09 PM MON 10/01/11
Warrill Ck at Harrisville #	3.82m rising	03:05 PM MON 10/01/11
Warrill Ck at Amberley DNR *	5.34m rising	08:10 AM MON 10/01/11
Bremer R at Ipswich #	6.6m rising	02:40 PM MON 10/01/11
Brisbane R at Moggill #	5.52m rising	02:59 PM MON 10/01/11
Brisbane R at Jindalee Br #	3.7m rising	02:50 PM MON 10/01/11
Brisbane R at City Gauge #	1.36m falling	03:09 PM MON 10/01/11

*automatic station

Warnings and River Height Bulletins are available at http://www.bom.gov.au/qld/flood/ . Flood Warnings are also available on telephone 1300 659 219 at a low call cost of 27.5 cents, more from mobile, public and satellite phones.

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may
contain confidential and/or privileged information. If you are not the addressee, you are notified that any
transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached

to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this
email in error please contact the sender immediately and delete the material from your email system.
QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Peter Baddiley [redacted]
Sent: Monday, 10 January 2011 4:33 PM
To: Barry Dennien
Cc: Dan Spiller; [redacted]
Subject: RE: Tech report [SEC=UNCLASSIFIED]
Attachments: Technical Situation Report W37_BOM.docx

Categories: T8

BOM additions as at 4:30pm Monday.

Peter Baddiley
Regional Hydrology Manager
Climate & Water Division
Bureau of Meteorology
Level 21, 69 Ann Street
GPO Box 413, BRISBANE, QLD, AUSTRALIA 4001
Phon[redacted]

From: Barry Dennien [redacted]
Sent: Monday, 10 January 2011 4:11 PM
To: Peter Baddiley
Cc: Dan Spiller
Subject: Tech report

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

TECHNICAL SITUATION REPORT

TSR Number	W37	Date of TSR release	10.1.2011	Time of TSR release	3pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue increasing releases to discharge flood waters but keep impact downstream to minimum.	
Strategy	• All bridges are now inundated . • Ramp up to 2800cumecs which will give a flow in the lower Brisbane River of around 4,000cumecs	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Significant rainfall has fallen in the Wivenhoe Dam catchment over the last 3 hours, with falls exceeding 100mm. This rainfall will significantly increase inflows into the dam. A severe weather warning remains current for heavy rainfall in the dam catchment areas. The QPF issued by BOM at 10:00 estimates rainfalls for the 24 hours to 10:00 Tuesday as North Pine Dam (75mm to 150mm); Wivenhoe/Somerset Dam Catchments (50mm – 100mm). Potentially significant rain moving towards the dam catchments is currently evident on the BOM radar.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 103.41m AHD and rising. Peak inflow to the dam is estimated to be about 4,200 m3/s. Five sluice gates are open releasing about 1,100m3/s (95,000ML/day) into Wivenhoe Dam. At this stage the dam lake level will reach about 103.5m AHD on Monday afternoon. Areas around Kilcoy will continue to be adversely affected.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

The dam level is 72.41m AHD and rising quickly. The rainfall experienced over the last 2 to 3 hours will result in significant further inflows into the dam and releases from the dam will need to be increased in accordance with Flood Mitigation procedures and to ensure that a fuse plug is not initiated. The initiation of a fuse plug will result in a rapid uncontrolled outflow from the dam of 2,000m3/s being added to the gate release outflow. Outflows into the Brisbane River from both Lockyer Creek and the Bremer River are also increasing.

Five radial gates are currently open at the dam releasing about 2,000m3/s into the Brisbane River and

this will need to be increased steadily to an outflow of 2,800m3/s over the next 9 hours (commencing at 1500). At this stage, the dam will reach about 73.8m AHD during Tuesday morning.

The objective for dam operations is currently to minimise the impact of urban flooding in areas downstream of the dam and to keep river flows in the lower Brisbane River below 4,000m3/s if possible. This is significantly less than the current estimated combined pre-dam peak inflow of 12,000m3/s. If further rainfall occurs, dam releases may need to be increased further and this may result in river flows in the lower Brisbane River approaching or exceeding 5,000m3/s.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer Creek flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Sunday 16 January in varying degrees.

Water levels in the lower Brisbane River will be impacted by the combined flows of Lockyer Creek, Bremer River, local runoff and releases from Wivenhoe Dam.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate rapidly over the next 24 hours. The flood operation centre will continue to monitor the situation and provide every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

Refer to details in latest Brisbane River flood warning issued at 4:16pm Monday 10 Jan. Warning is to be updated at 9pm tonight.

Ipswich: Reach about 12.7 metres (major) during Tuesday afternoon. Quicker rises and higher levels are possible depending on further rainfall tonight.

Moggill: Reach about 12 metres (minor) during Tuesday afternoon.

Jindalee: Reach about 7 metres (minor) overnight Tuesday.

Brisbane: Reach about 2.1 metres with the afternoon high tide on Tuesday.

Reach about 3 metres with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Further rises are possible at all four locations depending on further rain.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	Supervising Hydrologist, Flood Warning Centre
BoM Technical Officer contact details	flood.qld@bom.gov.au [redacted]

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time		or Event	Change in strategy

[redacted]

From: Barry Dennien
Sent: Monday, 10 January 2011 4:37 PM
To: stephen.robertso[redacted] ken.smith[redacted]
[redacted]
Martin.Peter[redacted]
debbie.best[redacted]
Cc: [redacted] damien.brown[redacted]
Bob.Reilly[redacted]
[redacted] Dan Spiller; [redacted]
Subject: FW: FLDWARN for Lower Brisbane and Bremer Rs [SEC=UNCLASSIFIED]

Categories: T8

Folks

For information

Barry Dennien

TO::BOM615

IDQ20805

Australian Government Bureau of Meteorology Queensland

PRIORITY
FLOOD WARNING FOR THE LOCKYER, BREMER, WARRILL AND BRISBANE RIVER BELOW WIVENHOE INCLUDING BRISBANE CITY Issued at 4:16 PM on Monday the 10th of January 2011 by the Bureau of Meteorology, Brisbane.

Stream level rises causing moderate to major flooding are being recorded in Lockyer Creek, Warrill Creek and and along the Bremer River. Major flood levels are likely at Ipswich during Tuesday.

Wivenhoe dam is providing significant mitigation of upper Brisbane floods. River flows from the Bremer and Lockyer catchments combined with releases from Wivenhoe dam are expected to increase levels in Brisbane overnight and through Tuesday.

At the Brisbane City Gauge, a river levels of about 2.1 metres is expected with the afternoon high tide on Tuesday and about 3 metres is expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

LOCKYER CREEK:
Further rainfall during Monday has led to renewed rises in the Lockyer Creek catchment. Rainfall is forecast to continue this evening and a return to moderate to major flood levels is expected overnight and during Tuesday. Major flood levels are expected to continue at Lyons Bridge with rises above 15 metres likely during Tuesday.

BREMER RIVER:
Rainfall during Monday will lead to renewed rises and a return to moderate flood levels along the Bremer River to Walloon. Levels over 5 metres are expected at Rosewood overnight.

The Bremer River at Ipswich is expected to reach about 12.7 metres on Tuesday afternoon. Higher levels are possible.

WARRILL CREEK
Further rainfall during Monday will lead to increasing river levels along Warrill Creek with levels expected to reach above 6 metres at Amberley overnight.

MIDDLE AND LOWER BRISBANE:
SEQwater advises releases from Wivenhoe Dam will increase during Monday.
Moderate flooding is expected at Savages Crossing and at Mt Crosby Weir overnight tonight and during Tuesday.

The Brisbane River at the City Gauge (lower end of Edward Street and at Thornton Street) is expected to reach about 2.1 metres with the afternoon high tide on Tuesday and reach about 3 metres with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Predicted River Heights/Flows:
Ipswich: Reach about 12.7 metres (major) during Tuesday afternoon. Quicker rises and higher levels are possible depending on further rainfall tonight.

Moggill: Reach about 12 metres (minor) during Tuesday afternoon.

Jindalee: Reach about 7 metres (minor) overnight Tuesday.

Brisbane: Reach about 2.1 metres with the afternoon high tide on Tuesday.
Reach about 3 metres with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Further rises are possible at all four locations depending on further rain.

Next Issue:
The next warning will be issued at about 9pm Monday.

Latest River Heights:

Lockyer Ck at Gatton #	10.36m	steady	03:04 PM MON 10/01/11
Laidley Ck at Laidley	6m	rising	02:45 PM MON 10/01/11
Laidley Ck at Showground Weir #	6.98m	rising	03:07 PM MON 10/01/11
Laidley Ck at Warrego Hwy *	5.43m	falling	01:00 PM MON 10/01/11
Lockyer Ck at Glenore Grove #	11.36m	falling	03:05 PM MON 10/01/11
Lockyer Ck at Lyons Br #	14.79m	rising	03:02 PM MON 10/01/11
Lockyer Ck at Rifle Range Rd *	13.4m	rising	08:20 AM MON 10/01/11
Brisbane R at Lowood Pump Stn #	14.13m	falling	03:07 PM MON 10/01/11
Brisbane R at Savages Crossing #	14.15m	rising	03:09 PM MON 10/01/11
Brisbane R at Burtons Br #	10.88m	rising	03:05 PM MON 10/01/11
Brisbane R at Kholo Br #	6.23m	rising	03:06 PM MON 10/01/11
Brisbane R at Mt Crosby #	14.26m	rising	03:07 PM MON 10/01/11
Brisbane R at Colleges Crossing #	11.96m	rising	03:09 PM MON 10/01/11
Bremer R at Spressers Br #	5.07m	rising	03:09 PM MON 10/01/11
Bremer R at Rosewood #	4.94m	rising	03:02 PM MON 10/01/11
Bremer R at Five Mile Br Walloon #	5.12m	falling	03:09 PM MON 10/01/11
Warrill Ck at Harrisville #	3.82m	rising	03:05 PM MON 10/01/11
Warrill Ck at Amberley DNR *	5.34m	rising	08:10 AM MON 10/01/11
Bremer R at Ipswich #	6.6m	rising	02:40 PM MON 10/01/11
Brisbane R at Moggill #	5.52m	rising	02:59 PM MON 10/01/11
Brisbane R at Jindalee Br #	3.7m	rising	02:50 PM MON 10/01/11

Brisbane R at City Gauge # 1.36m falling 03:09 PM MON 10/01/11

*automatic station

Warnings and River Height Bulletins are available at http://www.bom.gov.au/qld/flood/ . Flood Warnings are also available on telephone 1300 659 219 at a low call cost of 27.5 cents, more from mobile, public and satellite phones.

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system.
QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Reilly Bob [redacted]
Sent: Monday, 10 January 2011 4:39 PM
To: Birchley Michael; Dan Spiller
Cc: [redacted]
Subject: Evacuations downstream of Cressbrook Dam

Categories: T8

Hi Mike

There has been a rainfall event resulting in 150 to 200mm in less than 12 hours on the edge of the Eastern Darling Downs, As well as flash flooding in Toowoomba, Cressbrook and Perseverance Dams have filled and spilled. Evacuations are underway downstream of Cressbrook in accordance with the dam's Emergency Action Plan. (Neither dam is at risk of failure—it is just the volume of floodwaters involved.)

Dan

Apparently the alert for Cressbrook will be being broadcast on the ABC radio. This may heighten interest in flooding in Somerset Council area.

Regards

Bob

Bob Reilly

General Manager, Office of the Water Supply Regulator

Teleph [redacted]

Email: [redacted]

www.derm.qld.gov.au

Department of Environment and Resource Management

Lvl 3 41 George Street, Brisbane Q 4000

GPO Box 2454, Brisbane Q 4001

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

[redacted]

From: Barry Dennien
Sent: Monday, 10 January 2011 4:42 PM
To: Peter Baddiley
Cc: Dan Spiller
Subject: RE: Tech report [SEC=UNCLASSIFIED]

Categories: T8

Peter

Is this the right attachment does not appear to have any detail.

Barry

From: Peter Baddiley [redacted]
Sent: Monday, 10 January 2011 4:33 PM
To: Barry Dennien
Cc: Dan Spiller; [redacted]
Subject: RE: Tech report [SEC=UNCLASSIFIED]

BOM additions as at 4:30pm Monday.

Peter Baddiley
Regional Hydrology Manager
Climate & Water Division
Bureau of Meteorology
Level 21, 69 Ann Street
GPO Box 413, BRISBANE, QLD, AUSTRALIA 4001
[redacted]
EMAIL for flood matters: flood.qld@bom.gov.au
WWW : www.bom.gov.au

From: Barry Dennien [redacted]
Sent: Monday, 10 January 2011 4:11 PM
To: Peter Baddiley
Cc: Dan Spiller
Subject: Tech report

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: SEQWGM Media
Sent: Monday, 10 January 2011 4:50 PM
Subject: Water Grid Media Update - Dam Releases 10 January 2011

Categories: T8

Water Grid Media Update

Dam releases – 10 January 2011

Significant rainfall across the catchments has lifted Wivenhoe Dam's level to 154 per cent and Somerset Dam to 158 per cent, despite continuing releases.

Although releases are being made, large quantities of water continue to flow into the dams. Water is being held back in order to manage impacts downstream and allow for other inflows from urban runoff, the Lockyer and Bremer Rivers to subside.

Overnight, Fernvale and Mt Crosby Weir Bridges together with a number of local roads became inundated. They joined the others already impacted, including Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing.

In order to relieve the quickly filling flood storage compartment, and with more rain forecast, controlled releases from the dam have been increased today from 116,000 megalitres per day to 172,000 megalitres per day. Further increases to the release rate are planned, to approximately 240,000 megalitres per day by midnight.

These releases are a necessity as, at the peak, Wivenhoe Dam was receiving more than twice the volume of Sydney Harbour each day.

Releases are continually being reviewed in consultation with the Bureau of Meteorology and local councils, utilising a strategy to limit impacts where possible downstream.

Water from Somerset Dam is being released into Wivenhoe Dam through the sluice gates.

Spillway gate operations are continuing at North Pine Dam, with all five gates open, releasing around 43,000 megalitres a day. These releases may continue until Wednesday 12 January 2011.

At Leslie Harrison Dam, gate releases are underway. A minor release of around 1200 megalitres a day is being made through the emergency gates of Hinze Dam.

The Water Grid is working with local councils regarding the current releases and the likely impacts. Releases are being managed in accordance with approved flood management plans.

For further information on dam releases please visit www.watergrid.com.au.

Telephone - 1800 613 122 has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

Recreation update

Due to water levels, both Wivenhoe and Somerset are closed to all recreational activities, and will remain so for some days.

The following recreation sites are closed –

- O'Sheas Crossing
- Hamon Cove
- Logan Inlet
- Captain Logan Camp
- Lumley Hill
- Spillway Common/ Atkinson's Crossing
- Cormorant Bay
- Branch Creek
- Billies Bay/Hays Landing
- The Spit
- Lake Somerset Holiday Park Kirkleagh

Numerous roads are cut including the highway at Kilcoy and Fernvale, and conditions are extremely dangerous.

Ioogerah and Maroon Dam remains open, however, swimming and skiing should be avoiding.

Access to Borumba Dam is currently not available as Yabba Creek Road between Imbil and Borumba Dam is closed.

Lake Baroon has also been closed to all water based recreational activities but is open for picnics and barbeques. Care should be taken at the recreation sites, and vehicles must be parked in designated parking areas only.

Visitors should check the Water Grid website (www.watergrid.com.au) for additional information for each recreation site.

Gold Coast Desalination Plant

Even though the regions dams are at or near full capacity, recent heavy rains have resulted in high sediment levels in the Brisbane River. These increased levels may present challenges for water treatment plants like those at Mt Crosby, which are the main supply for Brisbane.

The Gold Coast Desalination facility was recently brought up to full capacity to address the flood associated issues at Mt Crosby without compromising water security or quality for Brisbane.

With Mt Crosby now back to normal the Gold Coast Desalination facility has now been reduced to 33 per cent capacity.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



[redacted]

From: Barry Dennien
Sent: Monday, 10 January 2011 5:17 PM
To: Colin Jensen
Cc: Dan Spiller
Subject: FW: FLDWARN for Lower Brisbane and Bremer Rs [SEC=UNCLASSIFIED]

Categories: T8

Col

I note the BOM prediction of 3 meters Wednesday do you concur?

How is the Suburb list going

thanks

Barry

TO::BOM615

IDQ20805

Australian Government Bureau of Meteorology Queensland

PRIORITY
FLOOD WARNING FOR THE LOCKYER, BREMER, WARRILL AND BRISBANE RIVER BELOW WIVENHOE INCLUDING BRISBANE CITY Issued at 4:16 PM on Monday the 10th of January 2011 by the Bureau of Meteorology, Brisbane.

Stream level rises causing moderate to major flooding are being recorded in Lockyer Creek, Warrill Creek and and along the Bremer River. Major flood levels are likely at Ipswich during Tuesday.

Wivenhoe dam is providing significant mitigation of upper Brisbane floods. River flows from the Bremer and Lockyer catchments combined with releases from Wivenhoe dam are expected to increase levels in Brisbane overnight and through Tuesday.

At the Brisbane City Gauge, a river levels of about 2.1 metres is expected with the afternoon high tide on Tuesday and about 3 metres is expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

LOCKYER CREEK:
Further rainfall during Monday has led to renewed rises in the Lockyer Creek catchment. Rainfall is forecast to continue this evening and a return to moderate to major flood levels is expected overnight and during Tuesday. Major flood levels are expected to continue at Lyons Bridge with rises above 15 metres likely during Tuesday.

BREMER RIVER:
Rainfall during Monday will lead to renewed rises and a return to moderate flood levels along the Bremer River to Walloon. Levels over 5 metres are expected at Rosewood overnight.

The Bremer River at Ipswich is expected to reach about 12.7 metres on Tuesday afternoon. Higher levels are possible.

WARRILL CREEK
Further rainfall during Monday will lead to increasing river levels along Warrill Creek with levels expected to reach above 6 metres at Amberley overnight.

MIDDLE AND LOWER BRISBANE:
SEQwater advises releases from Wivenhoe Dam will increase during Monday.
Moderate flooding is expected at Savages Crossing and at Mt Crosby Weir overnight tonight and during Tuesday.

The Brisbane River at the City Gauge (lower end of Edward Street and at Thornton Street) is expected to reach about 2.1 metres with the afternoon high tide on Tuesday and reach about 3 metres with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Predicted River Heights/Flows:
Ipswich: Reach about 12.7 metres (major) during Tuesday afternoon. Quicker rises and higher levels are possible depending on further ainfall tonight.

Moggill: Reach about 12 metres (minor) during Tuesday afternoon.

Jindalee: Reach about 7 metres (minor) overnight Tuesday.

Brisbane: Reach about 2.1 metres with the afternoon high tide on Tuesday. Reach about 3 metres with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Further rises are possible at all four locations depending on further rain.

Next Issue:
The next warning will be issued at about 9pm Monday.

Latest River Heights:

ockyer Ck at Gatton #	10.36m steady	03:04 PM MON 10/01/11
Laidley Ck at Laidley	6m rising	02:45 PM MON 10/01/11
Laidley Ck at Showground Weir #	6.98m rising	03:07 PM MON 10/01/11
Laidley Ck at Warrego Hwy *	5.43m falling	01:00 PM MON 10/01/11
Lockyer Ck at Glenore Grove #	11.36m falling	03:05 PM MON 10/01/11
Lockyer Ck at Lyons Br #	14.79m rising	03:02 PM MON 10/01/11
Lockyer Ck at Rifle Range Rd *	13.4m rising	08:20 AM MON 10/01/11
Brisbane R at Lowood Pump Stn #	14.13m falling	03:07 PM MON 10/01/11
Brisbane R at Savages Crossing #	14.15m rising	03:09 PM MON 10/01/11
Brisbane R at Burtons Br #	10.88m rising	03:05 PM MON 10/01/11
Brisbane R at Kholo Br #	6.23m rising	03:06 PM MON 10/01/11
Brisbane R at Mt Crosby #	14.26m rising	03:07 PM MON 10/01/11
Brisbane R at Colleges Crossing #	11.96m rising	03:09 PM MON 10/01/11
Bremer R at Spressers Br #	5.07m rising	03:09 PM MON 10/01/11
Bremer R at Rosewood #	4.94m rising	03:02 PM MON 10/01/11
Bremer R at Five Mile Br Walloon #	5.12m falling	03:09 PM MON 10/01/11
Warrill Ck at Harrisville #	3.82m rising	03:05 PM MON 10/01/11
Warrill Ck at Amberley DNR *	5.34m rising	08:10 AM MON 10/01/11
Bremer R at Ipswich #	6.6m rising	02:40 PM MON 10/01/11
Brisbane R at Moggill #	5.52m rising	02:59 PM MON 10/01/11
Brisbane R at Jindalee Br #	3.7m rising	02:50 PM MON 10/01/11

Brisbane R at City Gauge # 1.36m falling 03:09 PM MON 10/01/11

*automatic station

Warnings and River Height Bulletins are available at http://www.bom.gov.au/qld/flood/ . Flood Warnings are also available on telephone 1300 659 219 at a low call cost of 27.5 cents, more from mobile, public and satellite phones.

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system.
QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Barry Dennien
Sent: Monday, 10 January 2011 5:34 PM
To: Dan Spiller
Subject: FW: Information from Seqwater re 1974

Categories: T8

From: [redacted]
Sent: Monday, 10 January 2011 5:21 PM
To: Barry Dennien
Subject: Information from Seqwater re 1974

Hi Barry

Please see the answers from Seqwater re flow at Moggill in 1974 plus the other questions you had.

[redacted]

From: [redacted]
Sent: Monday, 10 January 2011 14:42
To: [redacted]
Subject: information required
Importance: High

Hi [redacted]

Barry has asked me to find out some information asap. The Wivenhoe information will be added to the media release I sent you earlier.

Can you please let me know

What the flow was at the Moggill gauge in 1974? Moggill flow was about 9,500 cumecs, or 817,000 megalitres per ay
What is Wivenhoe's current level? 153.9 per cent
How is Somerset sitting at 150% ? Is the water backed up or is there flood storage? The water is stored and raises the water level

Thanks

[redacted]
Senior Communications Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630



Swimming in weirs and f
flowing water is FAT

rethink

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it: any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received his email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: SEQWGM Media
Sent: Monday, 10 January 2011 5:48 PM
Subject: MEDIA RELEASE: UPPER SOMERSET TOWNSHIPS URGED TO CONSERVE WATER

Categories: T8

MEDIA RELEASE
10 JANUARY 2011

UPPER SOMERSET TOWNSHIPS URGED TO CONSERVE WATER

Residents in the upper Somerset townships of Kilcoy, Jimna and Linville are being urged to conserve water due to the impacts of local flooding on water infrastructure.

Water Grid spokesperson Dan Spiller said vital water infrastructure in these regions has been damaged by flood waters, cutting off the raw water supply.

"We have a limited supply in local reservoirs that is expected to last one to three days. However, we will ensure that critical supplies are maintained. In the meantime we are asking people to conserve water while we repair equipment and organise alternate supplies," he said.

The power is currently down at the main water treatment plant in Kilcoy, with flood water restricting access to rectify the situation.

In Jimna and Linville rising waters have impacted infrastructure that supports the region's supply.

Approximately 1,000 residents on town water across these three areas are impacted.

"We are asking people to restrict non-essential water use, including limiting shower times and considering alternative water supplies where possible," said Mr Spiller.

The Water Grid Manager is working closely with Emergency Management Queensland to gain access to the plants and to rectify all situations. Current demand and supply levels are being closely monitored and alternate water supplies are being considered.

"We are looking at trucking in tankers to fill the reservoirs and are also considering the supply of bottled water if necessary. Obviously we cannot truck in water while roads are closed," said Mr Spiller.

Residents with further supply questions can contact the Water Grid call centre on 1800 771 497.

ENDS

Notes to the editor

About the Water Grid

Established in June 2008 in response to the crippling Millennium Drought, the Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the Water Grid gives the South East Queensland region the ability to support

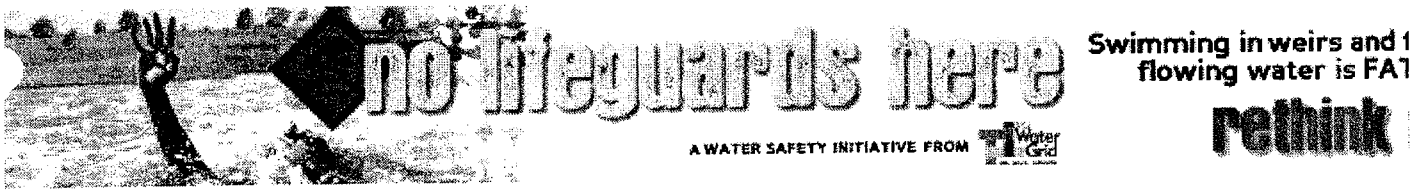
water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information visit www.watergrid.com.au

For further details contact the Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

SEQ Water Grid Communications Unit

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.



Dan Spiller

From: Dan Spiller
Sent: Monday, 10 January 2011 5:48 PM
To: [redacted]
Subject: RE: contact details for BCC re water effects
Attachments: Technical Situation Report W37.docx

Updated report as discussed.

Please call me on [redacted] if you have any queries or require any further information.

Regards,
Dan

`O::BOM615

IDQ20805

Australian Government Bureau of Meteorology Queensland

PRIORITY
FLOOD WARNING FOR THE LOCKYER, BREMER, WARRILL AND BRISBANE RIVER BELOW WIVENHOE INCLUDING BRISBANE CITY Issued at 4:16 PM on Monday the 10th of January 2011 by the Bureau of Meteorology, Brisbane.

Stream level rises causing moderate to major flooding are being recorded in Lockyer Creek, Warrill Creek and and along the Bremer River. Major flood levels are likely at Ipswich during Tuesday.

Wivenhoe dam is providing significant mitigation of upper Brisbane floods. River flows from the Bremer and Lockyer catchments combined with releases from Wivenhoe dam are expected to increase levels in Brisbane overnight and through Tuesday.

.t the Brisbane City Gauge, a river levels of about 2.1 metres is expected with the afternoon high tide on Tuesday and about 3 metres is expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

LOCKYER CREEK:
Further rainfall during Monday has led to renewed rises in the Lockyer Creek catchment. Rainfall is forecast to continue this evening and a return to moderate to major flood levels is expected overnight and during Tuesday. Major flood levels are expected to continue at Lyons Bridge with rises above 15 metres likely during Tuesday.

BREMER RIVER:
Rainfall during Monday will lead to renewed rises and a return to moderate flood levels along the Bremer River to Walloon. Levels over 5 metres are expected at Rosewood overnight.

The Bremer River at Ipswich is expected to reach about 12.7 metres on Tuesday afternoon. Higher levels are possible.

D371

WARRILL CREEK
Further rainfall during Monday will lead to increasing river levels along Warrill Creek with levels expected to reach above 6 metres at Amberley overnight.

MIDDLE AND LOWER BRISBANE:
SEQwater advises releases from Wivenhoe Dam will increase during Monday.
Moderate flooding is expected at Savages Crossing and at Mt Crosby Weir overnight tonight and during Tuesday.

The Brisbane River at the City Gauge (lower end of Edward Street and at Thornton Street) is expected to reach about 2.1 metres with the afternoon high tide on Tuesday and reach about 3 metres with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Predicted River Heights/Flows:
Ipswich: Reach about 12.7 metres (major) during Tuesday afternoon. Quicker rises and higher levels are possible depending on further rainfall tonight.

oggill: Reach about 12 metres (minor) during Tuesday afternoon.

Jindalee: Reach about 7 metres (minor) overnight Tuesday.

Brisbane: Reach about 2.1 metres with the afternoon high tide on Tuesday.
Reach about 3 metres with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Further rises are possible at all four locations depending on further rain.

Next Issue:
The next warning will be issued at about 9pm Monday.

Latest River Heights:

Lockyer Ck at Gatton #	10.36m steady	03:04 PM MON 10/01/11
aidley Ck at Laidley	6m rising	02:45 PM MON 10/01/11
Laidley Ck at Showground Weir #	6.98m rising	03:07 PM MON 10/01/11
Laidley Ck at Warrego Hwy *	5.43m falling	01:00 PM MON 10/01/11
Lockyer Ck at Glenore Grove #	11.36m falling	03:05 PM MON 10/01/11
Lockyer Ck at Lyons Br #	14.79m rising	03:02 PM MON 10/01/11
Lockyer Ck at Rifle Range Rd *	13.4m rising	08:20 AM MON 10/01/11
Brisbane R at Lowood Pump Stn #	14.13m falling	03:07 PM MON 10/01/11
Brisbane R at Savages Crossing #	14.15m rising	03:09 PM MON 10/01/11
Brisbane R at Burtons Br #	10.88m rising	03:05 PM MON 10/01/11
Brisbane R at Kholo Br #	6.23m rising	03:06 PM MON 10/01/11
Brisbane R at Mt Crosby #	14.26m rising	03:07 PM MON 10/01/11
Brisbane R at Colleges Crossing #	11.96m rising	03:09 PM MON 10/01/11
Bremer R at Spressers Br #	5.07m rising	03:09 PM MON 10/01/11
Bremer R at Rosewood #	4.94m rising	03:02 PM MON 10/01/11
Bremer R at Five Mile Br Walloon #	5.12m falling	03:09 PM MON 10/01/11
Warrill Ck at Harrisville #	3.82m rising	03:05 PM MON 10/01/11
Warrill Ck at Amberley DNR *	5.34m rising	08:10 AM MON 10/01/11
Bremer R at Ipswich #	6.6m rising	02:40 PM MON 10/01/11
Brisbane R at Moggill #	5.52m rising	02:59 PM MON 10/01/11
Brisbane R at Jindalee Br #	3.7m rising	02:50 PM MON 10/01/11
Brisbane R at City Gauge #	1.36m falling	03:09 PM MON 10/01/11

D372

*automatic station

Warnings and River Height Bulletins are available at http://www.bom.gov.au/qld/flood/ . Flood Warnings are also available on telephone 1300 659 219 at a low call cost of 27.5 cents, more from mobile, public and satellite phones.
----------Safe Stamp----------

From: [redacted]
Sent: Monday, 10 January 2011 10:54 AM
To: Dan Spiller
Subject: contact details for BCC re water effects

Dan

As per our conversation my email is attached and any further info will be great

Regards [redacted]

****
CONFIDENTIALITY: The information contained in this electronic mail message and any electronic files attached to it may be confidential information, and may also be the subject of legal professional privilege and/or public interest immunity. If you are not the intended recipient you are required to delete it. Any use, disclosure or copying of this message and any attachments is unauthorised. If you have received this electronic message in error, please inform the sender or contact securityscanner@police.qld.gov.au. This footnote also confirms that this email message has been checked for the presence of computer viruses.
****

[redacted]

From: Barry Dennien
Sent: Monday, 10 January 2011 6:16 PM
To: Dan Spiller; [redacted]
Subject: FW: BCC Innundation Map at 4000 cumecs
Attachments: img-110173945-0001.jpg

Categories: T8

From: [redacted]
Sent: Monday, 10 January 2011 6:12 PM
To: Barry Dennien
Subject: FW: BCC Innundation Map at 4000 cumecs

Barry

FYI

Regards

Ken Smith
Director-General
Department of the Premier and Cabinet

Phone: [redacted] Fax: [redacted]
Mobile: [redacted]
Email [redacted]

Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au

Please consider the environment before printing this email (3 sheets of paper = 1 litre of water)

From: Colin Jensen [redacted]
Sent: Monday, 10 January 2011 6:09 PM
To: Ken Smith
Subject: BCC Innundation Map at 4000 cumecs

Ken

As discussed, please find attached a map showing the innundation in Brisbane that is estimated to result from a river flow of 4,000 cubic meters per second. Note that this only shows the river flooding not innundation from localised rain flooding.

Regards

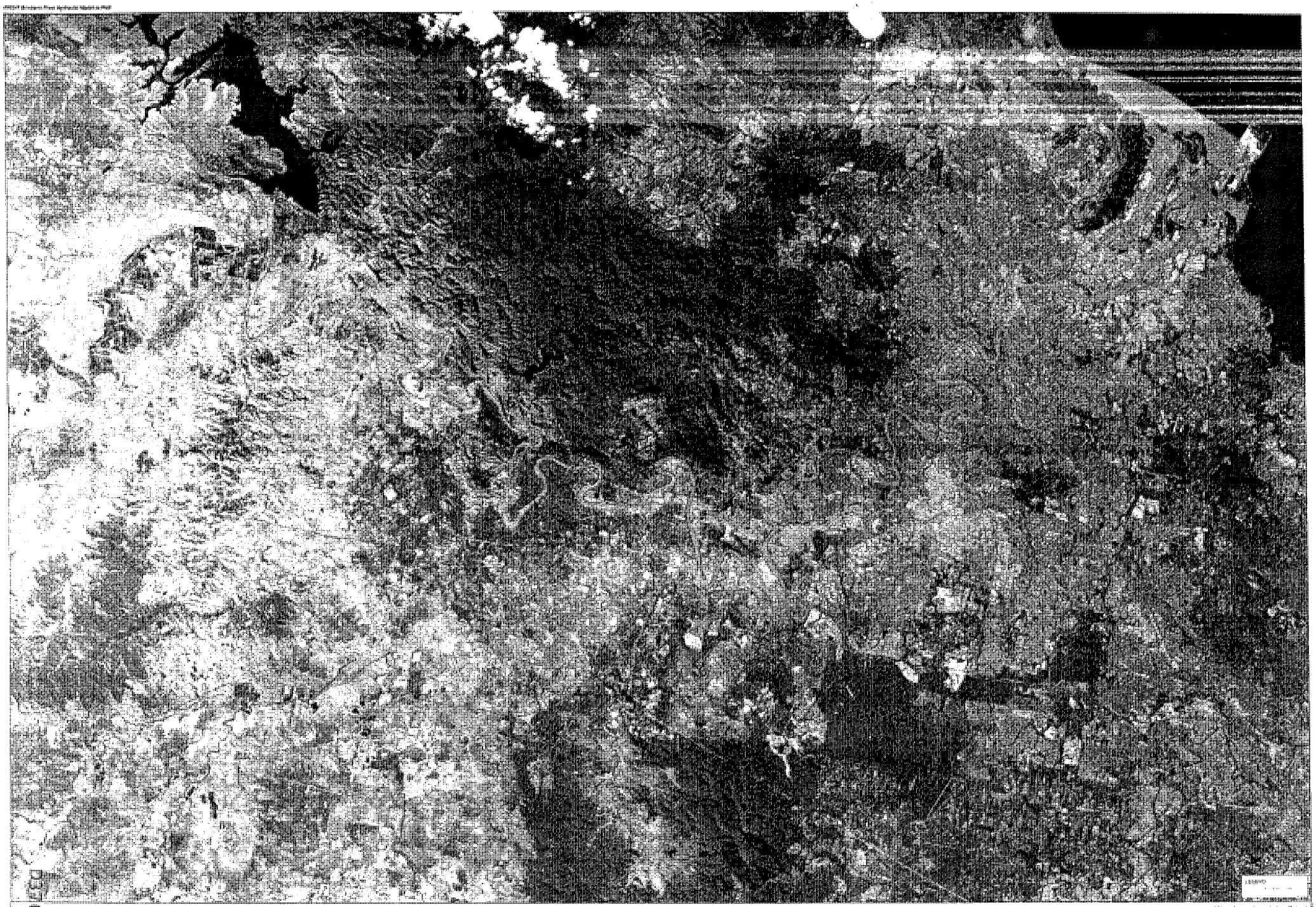
Colin Jensen
Chief Executive Officer
Brisbane City Council
GPO Box 1434 | Brisbane Qld 4001
Level 23, Brisbane Square | 266 George Street, Brisbane, Qld 4000
Phone: [redacted]
Email: [redacted]

This message has passed through an insecure network.
Please direct all enquiries to the message author.

This email is intended only for the addressee. Its use is limited to that intended by the author at the time and it is not to be distributed without the author's consent.

Unless otherwise stated, the State of Queensland accepts no liability for the contents of this email except where subsequently confirmed in writing. The opinions expressed in this email are those of the author and do not necessarily represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.



[illegible] Peak Discharge at Port Office Gauge Inundation Extent

Figure [illegible]

[redacted]

From: Barry Dennien
Sent: Monday, 10 January 2011 6:25 PM
To: [redacted]r; Dan Spiller
Subject: FW: List of suburbs impacted by innundation from a 4,000 cumec river flow

Categories: T8

From: Ken Smith [mailto[redacted]
Sent: Monday, 10 January 2011 6:24 PM
To: Barry Dennien
Subject: FW: List of suburbs impacted by innundation from a 4,000 cumec river flow

Barry

At last. I will call you to discuss assumptions underpinning number of properties impacted at 4,000 cubic meters assumption

Regards

Ken Smith
Director-General
Department of the Premier and Cabinet

Phone[redacted]
Mobile
Email:

Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au

Please consider the environment before printing this email (3 sheets of paper = 1 litre of water)

[redacted]

From: Colin Jensen[redacted]
Sent: Monday, 10 January 2011 6:21 PM
To: Ken Smith
Subject: List of suburbs impacted by innundation from a 4,000 cumec river flow

Ken

Please find following, as discussed, some information on the consequence of river innundation likely to result from a river flow of 4,000 cubic meters per second.

Number of properties affected:
- 455 properties (parcels of land) have been identified as experiencing flooding on next Wednesday (at least 221 of these are homes and businesses)
- 7, 731 properties may see some flooding either on the land or outside the property
- More than 400 streets will be affected by flooding in some way

Below is the list of suburbs where the 455 properties that will be affected are located. In brackets is the number of properties/parcels of land that will be affected in each suburb. This is based on the data and modelling we have done to date and we may see increases in these numbers once figures are revised.
- Rocklea (80)
- Albion (49)
- Milton (49)
- Auchenflower (40)
- Norman Park (26)
- Pinkenba (26)
0- Oxley (19)
- New Farm (17)
- Kangaroo Point (16)
- Bulimba & Sherwood (14 each)
- Yeronga (10)
- Graceville (9)
- Newstead (8)
- Yeerongpilly (7)
- Bowen Hills (6)
- Indooroopilly, Windsor (5 each)
- Wacol, Brisbane City, Moggill, East Brisbane, Fortitude Valley (4 each)
- Chelmer, Hemmant, Tennyson (3 each)
- Fairfield, Fig Tree Pocket, Coorparoo, South Brisbane, Lytton, Murrarie (2 each)
7 Rapid Response Group teams will be working from both a map and a database to doorknock/letterbox drop a flyer to the 221 homes and businesses that are predicted as being likely to experience innundation. They will visually check using the map that none of the remaining parcels of land from the total 455 properties identified as experiencing flooding are actually homes or businesses also.

The locations where the 221 homes and businesses are located is Albion, Auchenflower, Brisbane City, Bowen Hills, Bulimba, Fortitude Valley, Graceville, Hemmant, Indooroopilly, Kangaroo Point, Lytton, Milton, New Farm, Newstead, Norman Park, Oxley, Pinkenba, Rocklea, Sherwood, Tennyson, Wacol, Windsor, Yeronga.

Regards

Colin Jensen
Chief Executive Officer
Brisbane City Council
GPO Box 1434 | Brisbane Qld 4001
Level 23, Brisbane Square | 266 George Street, Brisbane, Qld 4000
Phone: [redacted]
Email: [redacted]

This message has passed through an insecure network.
Please direct all enquiries to the message author.

This email is intended only for the addressee. Its use is limited to that intended by the author at the time and it is not
to be distributed without the author's consent.

Unless otherwise stated, the State of Queensland accepts no liability for the contents of this email except where
subsequently confirmed in writing. The opinions expressed in this email are those of the author and do not necessarily
represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.

[redacted]

From: Colin Jensen [redacted]
Sent: Monday, 10 January 2011 6:39 PM
To: Barry Dennien
Cc: Dan Spiller
Subject: Re: FW: FLDWARN for Lower Brisbane and Bremer Rs [SEC=UNCLASSIFIED]

Categories: T8

Barry

Suburb list has been emailed. I've asked for confirmation around the 3m. I'm not clear whether it relates to a 4,0000 or 5,000 cumec event. BOM indicated that they were working with BCC in the numbers so I'm assuming we agree - my concern is what is the assumptions inherent in the predictions though. I will further insight tomorrow.

FYI. We have stood up our Local Disaster Management Group (chaired by the Lord Mayor) for 10am tomorrow. I understand that the Deputy Premier will be attending

Regards

Colin Jensen
Chief Executive Officer
Brisbane City Council
GPO Box 1434 | Brisbane Qld 4001
Level 23, Brisbane Square | 266 George Street, Brisbane, Qld 4000
Phone: [redacted]
Email: [redacted]

>>> Barry Dennien [redacted] 10/01/2011 5:16:34 pm >>>

Col

I note the BOM prediction of 3 meters Wednesday do you concur?

How is the Suburb list going

thanks

Barry

TO::BOM615

IDQ20805

Australian Government Bureau of Meteorology
Queensland

PRIORITY
FLOOD WARNING FOR THE LOCKYER, BREMER, WARRILL AND BRISBANE RIVER BELOW WIVENHOE INCLUDING BRISBANE CITY
Issued at 4:16 PM on Monday the 10th of January 2011
by the Bureau of Meteorology, Brisbane.

Stream level rises causing moderate to major flooding are being recorded in Lockyer Creek, Warrill Creek and and along the Bremer River. Major flood levels are likely at Ipswich during Tuesday.

Wivenhoe dam is providing significant mitigation of upper Brisbane floods. River flows from the Bremer and Lockyer catchments combined with releases from Wivenhoe dam are expected to increase levels in Brisbane overnight and through Tuesday.

At the Brisbane City Gauge, a river levels of about 2.1 metres is expected with the afternoon high tide on Tuesday and about 3 metres is expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

LOCKYER CREEK:
Further rainfall during Monday has led to renewed rises in the Lockyer Creek catchment. Rainfall is forecast to continue this evening and a return to moderate to major flood levels is expected overnight and during Tuesday. Major flood levels are expected to continue at Lyons Bridge with rises above 15 metres likely during Tuesday.

BREMER RIVER:
Rainfall during Monday will lead to renewed rises and a return to moderate flood levels along the Bremer River to Walloon. Levels over 5 metres are expected at Rosewood overnight.

The Bremer River at Ipswich is expected to reach about 12.7 metres on Tuesday afternoon. Higher levels are possible.

WARRILL CREEK
Further rainfall during Monday will lead to increasing river levels along Warrill Creek with levels expected to reach above 6 metres at Amberley overnight.

MIDDLE AND LOWER BRISBANE:
SEQwater advises releases from Wivenhoe Dam will increase during Monday. Moderate flooding is expected at Savages Crossing and at Mt Crosby Weir overnight tonight and during Tuesday.

The Brisbane River at the City Gauge (lower end of Edward Street and at Thornton Street) is expected to reach about 2.1 metres with the afternoon high tide on Tuesday and reach about 3 metres with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Predicted River Heights/Flows:
Ipswich: Reach about 12.7 metres (major) during Tuesday afternoon. Quicker rises and higher levels are possible depending on further rainfall tonight.

Moggill: Reach about 12 metres (minor) during Tuesday afternoon.

Jindalee: Reach about 7 metres (minor) overnight Tuesday.

Brisbane: Reach about 2.1 metres with the afternoon high tide on Tuesday. Reach about 3 metres with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Further rises are possible at all four locations depending on further rain.

Next Issue:
The next warning will be issued at about 9pm Monday.

Latest River Heights:

Lockyer Ck at Gatton #	10.36m	steady	03:04 PM MON 10/01/11
Laidley Ck at Laidley	6m	rising	02:45 PM MON 10/01/11
Laidley Ck at Showground Weir #	6.98m	rising	03:07 PM MON 10/01/11
Laidley Ck at Warrego Hwy *	5.43m	falling	01:00 PM MON 10/01/11
Lockyer Ck at Glenore Grove #	11.36m	falling	03:05 PM MON 10/01/11
Lockyer Ck at Lyons Br #	14.79m	rising	03:02 PM MON 10/01/11
Lockyer Ck at Rifle Range Rd *	13.4m	rising	08:20 AM MON 10/01/11
Brisbane R at Lowood Pump Stn #	14.13m	falling	03:07 PM MON 10/01/11
Brisbane R at Savages Crossing #	14.15m	rising	03:09 PM MON 10/01/11
Brisbane R at Burtons Br #	10.88m	rising	03:05 PM MON 10/01/11
Brisbane R at Kholo Br #	6.23m	rising	03:06 PM MON 10/01/11
Brisbane R at Mt Crosby #	14.26m	rising	03:07 PM MON 10/01/11
Brisbane R at Colleges Crossing #	11.96m	rising	03:09 PM MON 10/01/11
Bremer R at Spressers Br #	5.07m	rising	03:09 PM MON 10/01/11
Bremer R at Rosewood #	4.94m	rising	03:02 PM MON 10/01/11
Bremer R at Five Mile Br Walloon #	5.12m	falling	03:09 PM MON 10/01/11
Warrill Ck at Harrisville #	3.82m	rising	03:05 PM MON 10/01/11
Warrill Ck at Amberley DNR *	5.34m	rising	08:10 AM MON 10/01/11
Bremer R at Ipswich #	6.6m	rising	02:40 PM MON 10/01/11
Brisbane R at Moggill #	5.52m	rising	02:59 PM MON 10/01/11
Brisbane R at Jindalee Br #	3.7m	rising	02:50 PM MON 10/01/11
Brisbane R at City Gauge #	1.36m	falling	03:09 PM MON 10/01/11

*automatic station

Warnings and River Height Bulletins are available at
http://www.bom.gov.au/qld/flood/ . Flood Warnings are also available on telephone 1300 659 219 at a low call cost of 27.5 cents, more from mobile, public and satellite phones.

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system.
QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

****
This message has passed through an insecure network.
Please direct all enquiries to the message author.
****

This message has passed through an insecure network.
Please direct all enquiries to the message author.

[redacted]

From: Barry Dennien
Sent: Monday, 10 January 2011 6:45 PM
To: [redacted]

Cc: Dan Spiller; [redacted]
Attachments: img-110173945-0001.jpg; Technical Situation Report W37.docx

Categories: T8

Folks

Please find latest Technical report on Wivenhoe releases, BOM forecast of river heights accounting for the releases and downstream flows, and BCC flood maps accounting for the releases and downstream flows. Brisbane forecasts of properties impacted.

Further updates will be issued tomorrow morning.

Australian Government Bureau of Meteorology Queensland

PRIORITY
FLOOD WARNING FOR THE LOCKYER, BREMER, WARRILL AND BRISBANE RIVER BELOW WIVENHOE INCLUDING BRISBANE CITY Issued at 4:16 PM on Monday the 10th of January 2011 by the Bureau of Meteorology, Brisbane.

Stream level rises causing moderate to major flooding are being recorded in Lockyer Creek, Warrill Creek and and along the Bremer River. Major flood levels are likely at Ipswich during Tuesday.

Wivenhoe dam is providing significant mitigation of upper Brisbane floods. River flows from the Bremer and Lockyer catchments combined with releases from Wivenhoe dam are expected to increase levels in Brisbane overnight and through Tuesday.

At the Brisbane City Gauge, a river levels of about 2.1 metres is expected with the afternoon high tide on Tuesday and about 3 metres is expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

LOCKYER CREEK:
Further rainfall during Monday has led to renewed rises in the Lockyer Creek catchment. Rainfall is forecast to continue this evening and a return to moderate to major flood levels is expected overnight and during Tuesday. Major flood levels are expected to continue at Lyons Bridge with rises above 15 metres likely during Tuesday.

BREMER RIVER:
Rainfall during Monday will lead to renewed rises and a return to moderate flood levels along the Bremer River to Walloon. Levels over 5 metres are expected at Rosewood overnight.

The Bremer River at Ipswich is expected to reach about 12.7 metres on Tuesday afternoon. Higher levels are possible.

WARRILL CREEK
Further rainfall during Monday will lead to increasing river levels along Warrill Creek with levels expected to reach above 6 metres at Amberley overnight.

MIDDLE AND LOWER BRISBANE:
SEQwater advises releases from Wivenhoe Dam will increase during Monday.
Moderate flooding is expected at Savages Crossing and at Mt Crosby Weir overnight tonight and during Tuesday.

The Brisbane River at the City Gauge (lower end of Edward Street and at Thornton Street) is expected to reach about 2.1 metres with the afternoon high tide on Tuesday and reach about 3 metres with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Predicted River Heights/Flows:
Ipswich: Reach about 12.7 metres (major) during Tuesday afternoon. Quicker rises and higher levels are possible depending on further rainfall tonight.

Moggill: Reach about 12 metres (minor) during Tuesday afternoon.

Jindalee: Reach about 7 metres (minor) overnight Tuesday.

Brisbane: Reach about 2.1 metres with the afternoon high tide on Tuesday.
Reach about 3 metres with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Further rises are possible at all four locations depending on further rain.

Next Issue:
The next warning will be issued at about 9pm Monday.

Brisbane Properties affected

Number of properties affected:
- 455 properties (parcels of land) have been identified as experiencing flooding on next Wednesday (at least 221 of these are homes and businesses)
- 7, 731 properties may see some flooding either on the land or outside the property
- More than 400 streets will be affected by flooding in some way

Below is the list of suburbs where the 455 properties that will be affected are located. In brackets is the number of properties/parcels of land that will be affected in each suburb. This is based on the data and modelling we have done to date and we may see increases in these numbers once figures are revised.
- Rocklea (80)
- Albion (49)
- Milton (49)
- Auchenflower (40)
- Norman Park (26)
- Pinkenba (26)
0- Oxley (19)
- New Farm (17)
- Kangaroo Point (16)
- Bulimba & Sherwood (14 each)
- Yeronga (10)

- Graceville (9)
- Newstead (8)
- Yeerongpilly (7)
- Bowen Hills (6)
- Indooroopilly, Windsor (5 each)
- Wacol, Brisbane City, Moggill, East Brisbane, Fortitude Valley (4 each)
- Chelmer, Hemmant, Tennyson (3 each)
- Fairfield, Fig Tree Pocket, Coorparoo, South Brisbane, Lytton, Murrarie (2 each)

7 Rapid Response Group teams will be working from both a map and a database to doorknock/letterbox drop a flyer to the 221 homes and businesses that are predicted as being likely to experience innundation. They will visually check using the map that none of the remaining parcels of land from the total 455 properties identified as experiencing flooding are actually homes or businesses also.

The locations where the 221 homes and businesses are located is Albion, Auchenflower, Brisbane City, Bowen Hills, Bulimba, Fortitude Valley, Graceville, Hemmant, Indooroopilly, Kangaroo Point, Lytton, Milton, New Farm, Newstead, Norman Park, Oxley, Pinkenba, Rocklea, Sherwood, Tennyson, Wacol, Windsor, Yeronga.

Number of properties affected:

- 455 properties (parcels of land) have been identified as experiencing flooding on next Wednesday (at least 221 of these are homes and businesses)
- 7, 731 properties may see some flooding either on the land or outside the property
- More than 400 streets will be affected by flooding in some way

'elow is the list of suburbs where the 455 properties that will be affected are located. In brackets is the number of properties/parcels of land that will be affected in each suburb. This is based on the data and modelling we have done to date and we may see increases in these numbers once figures are revised.

- Rocklea (80)
- Albion (49)
- Milton (49)
- Auchenflower (40)
- Norman Park (26)
- Pinkenba (26)

0- Oxley (19)

- New Farm (17)
- Kangaroo Point (16)
- Bulimba & Sherwood (14 each)
- Yeronga (10)
- Graceville (9)
- Newstead (8)
- Yeerongpilly (7)
- Bowen Hills (6)
- Indooroopilly, Windsor (5 each)

Wacol, Brisbane City, Moggill, East Brisbane, Fortitude Valley (4 each)

- Chelmer, Hemmant, Tennyson (3 each)
- Fairfield, Fig Tree Pocket, Coorparoo, South Brisbane, Lytton, Murrarie (2 each)

7 Rapid Response Group teams will be working from both a map and a database to doorknock/letterbox drop a flyer to the 221 homes and businesses that are predicted as being likely to experience innundation. They will visually check using the map that none of the remaining parcels of land from the total 455 properties identified as experiencing flooding are actually homes or businesses also.

The locations where the 221 homes and businesses are located is Albion, Auchenflower, Brisbane City, Bowen Hills, Bulimba, Fortitude Valley, Graceville, Hemmant, Indooroopilly, Kangaroo Point, Lytton, Milton, New Farm, Newstead, Norman Park, Oxley, Pinkenba, Rocklea, Sherwood, Tennyson, Wacol, Windsor, Yeronga.

Regards

Barry Dennien
Chief Executive Officer
SEQ Wat[redacted]
Phone: (

Email: [redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

TECHNICAL SITUATION REPORT

TSR Number	W37	Date of TSR release	10.1.2011	Time of TSR release	3pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Continue increasing releases to discharge flood waters but keep impact downstream to minimum.	
Strategy	• All bridges are now inundated . • Ramp up to 2800cumecs which will give a flow in the lower Brisbane River of around 4,000cumecs	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Significant rainfall has fallen in the Wivenhoe Dam catchment over the last 3 hours, with falls exceeding 100mm. This rainfall will significantly increase inflows into the dam. A severe weather warning remains current for heavy rainfall in the dam catchment areas. The QPF issued by BOM at 10:00 estimates rainfalls for the 24 hours to 10:00 Tuesday as North Pine Dam (75mm to 150mm); Wivenhoe/Somerset Dam Catchments (50mm – 100mm). Potentially significant rain moving towards the dam catchments is currently evident on the BOM radar.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 103.41m AHD and rising. Peak inflow to the dam is estimated to be about 4,200 m3/s. Five sluice gates are open releasing about 1,100m3/s (95,000ML/day) into Wivenhoe Dam. At this stage the dam lake level will reach about 103.5m AHD on Monday afternoon. Areas around Kilcoy will continue to be adversely affected.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

The dam level is 72.41m AHD and rising quickly. The rainfall experienced over the last 2 to 3 hours will result in significant further inflows into the dam and releases from the dam will need to be increased in accordance with Flood Mitigation procedures and to ensure that a fuse plug is not initiated. The initiation of a fuse plug will result in a rapid uncontrolled outflow from the dam of 2,000m3/s being added to the gate release outflow. Outflows into the Brisbane River from both Lockyer Creek and the Bremer River are also increasing.

Five radial gates are currently open at the dam releasing about 2,000m3/s into the Brisbane River and

this will need to be increased steadily to an outflow of 2,800m3/s over the next 9 hours (commencing at 1500). At this stage, the dam will reach about 73.8m AHD during Tuesday morning.

The objective for dam operations is currently to minimise the impact of urban flooding in areas downstream of the dam and to keep river flows in the lower Brisbane River below 4,000m3/s if possible. This is significantly less than the current estimated combined pre-dam peak inflow of 12,000m3/s. If further rainfall occurs, dam releases may need to be increased further and this may result in river flows in the lower Brisbane River approaching or exceeding 5,000m3/s.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer Creek flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Sunday 16 January in varying degrees.

Water levels in the lower Brisbane River will be impacted by the combined flows of Lockyer Creek, Bremer River, local runoff and releases from Wivenhoe Dam.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate rapidly over the next 24 hours. The flood operation centre will continue to monitor the situation and provide every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time		Or Event	Change in strategy

[redacted]

From: Best Debbie [redacted]
Sent: Monday, 10 January 2011 6:56 PM
To: Dan Spiller
Subject: Fw: Wyaralong Dam - Water Level Update - 10 January 2011
Attachments: image003.png; image004.jpg; image005.jpg; image006.jpg

Categories: T8

Dan
Ca you please advise?
Also Terry as acting DG has a SDMG at 8. Could I have latest info prior to that?
Thanks

----- Original Message -----
From: [redacted]
To: Best Debbie
Sent: Mon Jan 10 18:09:14 2011
Subject: RE: Wyaralong Dam - Water Level Update - 10 January 2011

Thanks Debbie

Are you able to check if there are any flooding risks downstream of the dam if it does spill?

Just so we are ready.

[redacted]

[redacted]
Policy Advisor
Office of the Minister for Natural Resources,
Mines and Energy and Minister for Trade
Phon[redacted]
Mobi
Fax: [redacted]

From: Best Debbie [redacted]
Sent: Monday, 10 January 2011 5:54 PM
[redacted]
Subject: FW: Wyaralong Dam - Water Level Update - 10 January 2011

[redacted]

Information about Wyaralong.

Debbie

From: Peter Borrows [redacted]
Sent: Monday, 10 January 2011 4:21 PM
To: Best Debbie; Dennien Barry
Cc: Peter Borrows
Subject: FW: Wyaralong Dam - Water Level Update - 10 January 2011

FYI

Regards, Peter.

Peter Borrows

Chief Executive Officer

Queensland Bulk Water Su <<image003.png>> pply Authority trading as Seqwater

[redacted]

evel 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002

Website | www.seqwater.com.au < <<image004.jpg>> http://www.seqwater.com.au/>

From: Rob Drury
Sent: Monday, 10 January 2011 4:20 PM
To: Peter Borrows; Terry Malone; John Tibaldi; [redacted]
Subject: FW: Wyaralong Dam - Water Level Update - 10 January 2011

FYI

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Wate <<image005.jpg>> r Supply Authority trading as Seqwater

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au <http://www.seqwater.com.au/>

From: [redacted]
Sent: Monday, 10 January 2011 4:13 PM
[redacted]
Cc: [redacted] - External; Rob Drury; Barton Maher; [redacted]
Subject: Wyaralong Dam - Water Level Update - 10 January 2011

Dear All,

The purpose of this email is to update you on the water storage situation at Wyaralong Dam.

Wyaralong Dam is currently storing 84% of its total storage capacity.

The Teviot Brook catchment has experienced periods of moderate to heavy rainfall during the past 24 hours resulting in moderate to major stream flows being recorded in the Teviot Brook upstream of the dam.

The Wyaralong Dam Alliance is currently on a 'watching brief' and monitoring the water level within the dam, with indications that water will pass over the spillway sometime between tomorrow and Friday.

I will keep you advised of the water levels within the Wyaralong Dam.

Should you have any questions or concerns please do not hesitate to contact me.

Regards

[redacted] Deputy Alliance Manager
Wyaralong Dam Alliance
[redacted] | W: www.wyaralongdam.com.au
<http://www.wyaralongdam.com.au/>

<<image006.jpg>>
2035 Beaudesert Boonah Road, Beaudesert QLD 4285

PO Box 5, Beaudesert QLD 4285

IMPORTANT NOTICE:
This email and any attachments are confidential and may be privileged in which case neither is intended to be waived. If you have received this message in error, please notify us and delete the e-mail and all copies. Wyaralong Dam Alliance does not guarantee that this e-mail is virus or error free. The attached files are provided and may only be used on the basis that the user assumes all responsibility for any loss, damage or consequence resulting directly or indirectly from the use of the attached files, whether caused by the negligence of the sender or not. Wyaralong Dam Alliance is not responsible for any changes made to a document other than those made by Wyaralong Dam Alliance, or for the effect of any changes (not made by Wyaralong Dam Alliance) on a document's meaning. Wyaralong Dam Alliance is not responsible for the content and opinions in non-business related e-mail.

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

Dan Spiller

From: [redacted]
Sent: Monday, 10 January 2011 7:31 PM
To: SEQWGM Media; [redacted] Mike Foster; [redacted] Barry Dennien; Dan Spiller; [redacted]
Cc:
Subject: Release update
Attachments: image001.jpg; image004.jpg

As at 7.00 pm on Monday 10 January, the following applies:

SOMERSET DAM:
As a result of rainfall and inflows, water is being released into Wivenhoe through five sluice gates at about 146,000 megalitres per day, reducing to 103,000 megalitres per day by late Tuesday 11 January, and is likely to continue until Thursday 13 January. Areas around Kilcoy are likely to be impacted as a result of the rising dam levels.

WIVENHOE DAM:
Upstream levels are rising quickly as a result of significant heavy rainfall. The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam.

Gate Releases are being increased to 240,000 megalitres a day are underway and are to continue until at least Sunday 16 January.

Local Councils have been advised that as a result of Lockyer Creek flows, local runoff and Wivenhoe releases, Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge Colleges Crossing, Fernvale Bridge, and Mt Crosby Weir Bridge may be inundated until at least the weekend.

NORTH PINE DAM:
Five gates are open, releasing around 31,000 megalitres a day and will continue until at least Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

LESLIE HARRISON DAM:
Gate releases are underway due to rainfall and inflows.

HINZE DAM:
A minor release of around 1200 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

For detailed information on road crossing closures and other potential impacts, always contact your local council.

This information will be updated on the morning of Tuesday 11 January.

[redacted]
Senior Communications Advisor
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]

Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au



Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Litsupport Brisbane

From: Dan Spiller
Sent: Monday, 10 January 2011 8:06 PM
To: 'Best Debbie'
Subject: RE: Wyaralong Dam - Water Level Update - 10 January 2011

Makes more sense - I thought you were getting a little excited about Wyaralong.

-----Original Mess[redacted]
From: Best Debbie [redacted]
Sent: Monday, January 10, 2011 8:05 PM
To: Dan Spiller
Subject: Re: Wyaralong Dam - Water Level Update - 10 January 2011

The update I referred to was for Wthe Wivenhoe situation.
Thanks

----- Original Message -----
From: Dan Spiller [redacted]
To: Best Debbie
Sent: Mon Jan 10 20:00:49 2011
Subject: RE: Wyaralong Dam - Water Level Update - 10 January 2011

Debbie,

Short answer is no risks. The dam did not exist until recently, obviously. Also, the volumes involved are relatively minor - from memory the total dam capacity is only about 117,000 ML.

[redacted] (QWI CEO) has been updating me several times daily - I suspect mostly because he enjoys my response. I will request an update by 7.30 - though it may depend upon when people are on site. I will also ask him to advise if Councils raise any flooding concerns.

Dan

From: Best Debbie [redacted]
Sent: Monday, January 10, 2011 6:56 PM
To: Dan Spiller
Subject: Fw: Wyaralong Dam - Water Level Update - 10 January 2011

Dan
Ca you please advise?
Also Terry as acting DG has a SDMG at 8. Could I have latest info prior to that?
Thanks

----- Original Message -----

[redacted]
To: Best Debbie
Sent: Mon Jan 10 18:09:14 2011
Subject: RE: Wyaralong Dam - Water Level Update - 10 January 2011

Thanks Debbie

Are you able to check if there are any flooding risks downstream of the dam if it does spill?

Just so we are ready.

[redacted]
Policy Advisor
Office of the Minister for Natural Resources, Mines and Energy and Minister for Trade
[redacted]

From: Best Debbie [redacted]
Sent: Monday, 10 January 2011 5:54 PM
To: [redacted]
Subject: FW: Wyaralong Dam - Water Level Update - 10 January 2011

[redacted]

Information about Wyaralong.

Debbie

From: Peter Borrows [redacted]
Sent: Monday, 10 January 2011 4:21 PM
To: Best Debbie; Dennien Barry
Cc: Peter Borrows
Subject: FW: Wyaralong Dam - Water Level Update - 10 January 2011

FYI

Regards, Peter.

Peter Borrows

Chief Executive Officer

Queensland Bulk Water Su <<image003.png>> pply Authority trading as Seqwater

[redacted]

Level 3, 240 Margaret St, Brisbane City QLD 4000 PO Box 16146, City East QLD 4002

Website | www.seqwater.com.au < <<image004.jpg>> http://www.seqwater.com.au/ <http://www.seqwater.com.au/> >

From: Rob Drury
Sent: Monday, 10 January 2011 4:20 PM
To: Peter Borrows; Terry Malone; John Tibaldi; [redacted]
Subject: FW: Wyaralong Dam - Water Level Update - 10 January 2011

FYI

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Wate <<image005.jpg>> r Supply Authority trading as Seqwater

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au <http://www.seqwater.com.au/>

[redacted]

Sent: Monday, 10 January 2011 4:13 PM

[redacted]

[redacted]EMQ - Duty Officer [redacted]

[redacted]

[redacted] - External; Rob Drury; Barton Maher; [redacted]External

Subject: Wyaralong Dam - Water Level Update - 10 January 2011

Dear All,

The purpose of this email is to update you on the water storage situation at Wyaralong Dam.

Wyaralong Dam is currently storing 84% of its total storage capacity.

The Teviot Brook catchment has experienced periods of moderate to heavy rainfall during the past 24 hours resulting in moderate to major stream flows being recorded in the Teviot Brook upstream of the dam.

The Wyaralong Dam Alliance is currently on a 'watching brief' and monitoring the water level within the dam, with indications that water will pass over the spillway sometime between tomorrow and Friday.

I will keep you advised of the water levels within the Wyaralong Dam.

Should you have any questions or concerns please do not hesitate to contact me.

Regards

[redacted] | Deputy Alliance Manager
Wyaralong Dam Alliance

[redacted]

[redacted] | W: www.wyaralongdam.com.au
<http://www.wyaralongdam.com.au/>

<<image006.jpg>>
2035 Beaudesert Boonah Road, Beaudesert QLD 4285

PO Box 5, Beaudesert QLD 4285

IMPORTANT NOTICE:
This email and any attachments are confidential and may be privileged in which case neither is intended to be waived. If you have received this message in error, please notify us and delete the e-mail and all copies. Wyaralong Dam Alliance does not guarantee that this e-mail is virus or error free. The attached files are provided and may only be used on the basis that the user assumes all responsibility for any loss, damage or consequence resulting directly or indirectly from the use of the attached files, whether caused by the negligence of the sender or not. Wyaralong Dam Alliance is not responsible for any changes made to a document other than those made by Wyaralong Dam Alliance, or for the effect of any changes (not made by Wyaralong Dam Alliance) on a document's meaning. Wyaralong Dam Alliance is not responsible for the content and opinions in non-business related e-mail.

---Safe Stamp---
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

+---+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+---+

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: Dan Spiller
Sent: Monday, 10 January 2011 8:18 PM
To: 'Rob Drury'
Cc: [redacted] Barry Dennien; [redacted]
Subject: Early update required tomorrow

Categories: T8

Rob,

SDMG is early tomorrow - with Wivenhoe Dam releases obviously a key consideration.

Can you please provide an update on status to me by 7.30? A TSR would be ideal.

Obviously, the key issue will be whether additional rainfall triggers the need for an increased release rate. Beyond that, at a minimum, could you please cover overnight rainfall, dam levels and release rates.

Apologies for the late notice. I have only just been advised.

Regards,
Dan

[redacted]

From: Rob Drury [redacted]
Sent: Monday, 10 January 2011 8:39 PM
To: Dan Spiller
Subject: Re: Early update required tomorrow

Categories: T8

Will do.
Rob

From: Dan Spiller [redacted]
To: Rob Drury
Cc: Peter Borrows; Barry Dennien [redacted]
Sent: Mon Jan 10 20:18:13 2011
Subject: Early update required tomorrow

Rob,

SDMG is early tomorrow - with Wivenhoe Dam releases obviously a key consideration.

Can you please provide an update on status to me by 7.30? A TSR would be ideal.

Obviously, the key issue will be whether additional rainfall triggers the need for an increased release rate. Beyond that, at a minimum, could you please cover overnight rainfall, dam levels and release rates.

Apologies for the late notice. I have only just been advised.

Regards,
Dan

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Best Debbie [redacted]
Sent: Tuesday, 11 January 2011 6:03 AM
To: Dan Spiller
Subject: What is latest situation with wivenhoe so I can advise Terry before 8?

Categories: T8

+----------+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+----------+

[redacted]

From: SEQWGM Media
Sent: Tuesday, 11 January 2011 6:11 AM
To: Barry Dennien; Dan Spiller; [redacted]
Subject: Fwd: media alert - withcott
Attachments: Withcott residents without water.pdf; ATT00001.htm

Categories: T8

FYI issued by quu this morning

[redacted]

Sent from my iPhone

Begin forwarded message:

> **From:** [redacted]
> **Date:** 11 January 2011 5:54:41 AM GMT+10:00
> **To:** SEQWGM Media [redacted]
> **Subject: media alert - withcott**
>
> Please see attached, issued to local media before 6am.
>
> Thanks
> [redacted]

This message has passed through an insecure network.
Please direct all enquiries to the message author.

MEDIA ALERT

11 January 2011

WITHCOTT RESIDENTS WITHOUT WATER

About 750 Lockyer Valley residents are without water after flood water last night significantly damaged a water pump station at Withcott, nine kilometres east of Toowoomba.

Damage to the pump station, water infrastructure and pipes has cut water supply to about half of the town.

As a preliminary measure, a water tanker will be in the town centre from 6am this morning and residents without water are advised to fill water containers.

To preserve the town's limited stored water supply, residents with water are being urged to restrict all non-essential use until further notice. Exemptions are permitted for households where there are infants, elderly people, or residents with health issues.

Queensland Urban Utilities is working urgently to assess the situation with the view to restoring the water supply as soon as possible.

Residents are encouraged to make sure their neighbours are aware of water availability and the need to conserve water.

Further updates will be available later this morning.

Media contact: [redacted]

Litsupport Brisbane

From: Dan Spiller
Sent: Tuesday, 11 January 2011 6:29 AM
To: Debbie Best
Cc: [redacted] Barry Dennien [redacted]

Subject: Fwd: Impact of Lockyer flows
Attachments: Seqwater_No-Lifeguards-Here_email_strap.png; ATT00001.htm; cidimage001.png@01CA24E1.BDB90020; ATT00002.htm

Debbie,

Preliminary advice below. Report being prepared and BoM remodeling.

Dan

Begin forwarded message:

From: Rob Drury [redacted]
Date: 11 January 2011 6:17:48 AM GMT+10:00
To: Dan Spiller <[redacted]
Cc: Barry Dennien <[redacted]>, Peter Borrows [redacted]
Subject: RE: Impact of Lockyer flows

Dan,

I will send a report shortly but below are words I was going to send. I have also attached the BoM warning for the Lockyer that they sent this morning.

They are reissuing their warning this morning based on new information.

Basically the FOC was going to try to slow our releases last night to give a small window for the Lockyer flood to go through however we again received and are still receiving heavy rain in the catchments.

Currently the FOC has shut some sluices at Somerset to store more water to keep Wivenhoe below RL74 at which we need to start increasing releases. The first fuse plug goes at about RL 75.7m

The strategy is now to keep releases as is to not worsen the situation downstream as the Lockyer recorded levels higher than any on record. However we may still need to increase releases depending on what happens through the day.

The FOC have given our release strategy (not really different in releases at this stage) to the BoM and they will reissue their flood warnings based on that and other flows in the Lockyer and Bremer.

The FOC have spoken to BCC and ICC and we will send them an update. BCC are having a LDMG meeting this morning. Dan, not sure if anyone from the WGM is going but Chris Lavin is the contact.

Rob

From: Aifs Operational Manager [redacted]

Sent: Tuesday, January 11, 2011 4:06:54 AM

To: weather

Subject: BOM: FLDWARN for Lower Brisbane and Bremer Rs [SEC=UNCLASSIFIED] Auto forwarded by a Rule

TO::BOM615

IDQ20805

Australian Government Bureau of Meteorology Queensland

PRIORITY

FLOOD WARNING FOR THE LOCKYER, BREMER, WARRILL AND BRISBANE RIVER BELOW WIVENHOE INCLUDING BRISBANE CITY Issued at 4:06 AM on Tuesday the 11th of January 2011 by the Bureau of Meteorology, Brisbane.

The main flood waters in the Lockyer Creek are now arriving at Lyons Bridge, with strong stream rises expected during Tuesday.

Wivenhoe dam is providing significant mitigation of upper Brisbane floods. River flows from the Bremer and Lockyer catchments combined with releases from Wivenhoe dam are expected to increase levels in Brisbane during Tuesday.

At the Brisbane City Gauge, minor flood levels of about 2.1 metres are expected with the afternoon high tide on Tuesday and levels of about 3 metres are expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

LOCKYER CREEK:

Extremely heavy rainfall during Monday led to extreme rises in the Lockyer Creek catchment and Laidley Creek at Mulgowie. Record flood levels of 18.92 metres were recorded at Gatton Monday evening before the station failed. This level was well above the previous record peak of 16.33 metres from the February 1893 flood.

The main flood waters are currently arriving at Lyons Bridge, with strong stream rises expected in the next few hours. The Lockyer Creek at Glenore Grove peaked at 14.60 metres at 11:30pm, which is 0.3 metres below the 1974 flood.

Renewed stream rises have commenced in Lockyer Creek at Lyons Bridge with a peak between 16 and 16.5 metres expected Tuesday morning. This is likely to be similar in level to the 1996 flood.

BREMER RIVER:

The Bremer River at Walloon has exceeded the moderate flood level. The Bremer River at Rosewood peaked at 5.8 metres around midnight monday.

The Bremer River at Ipswich is expected to reach about 12.7 metres on Tuesday afternoon. Higher levels are possible.

WARRILL CREEK

Warrill Creek at Amberley peaked at 5.98 metres around 9pm Monday.

MIDDLE AND LOWER BRISBANE:

Moderate flooding is developing at Savages Crossing and at Mt Crosby Weir.

At the Brisbane City Gauge (lower end of Edward Street and at Thornton Street), minor flood levels of about 2.1 metres are expected with the afternoon high tide on Tuesday and levels of about 3 metres are expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Predicted River Heights/Flows:

Ipswich: Reach about 12.7 metres (major) during Tuesday afternoon.

Moggill: Reach about 12 metres (minor) during Tuesday afternoon.

Jindalee: Reach about 7 metres (minor) overnight Tuesday.

Brisbane: Reach about 2.1 metres (minor) with the afternoon high tide on Tuesday. Reach about 3 metres (moderate) with the high tides on Wednesday.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Further rises are possible at all four locations depending on further rain.

Next Issue:

The next warning will be issued at about 8am Tuesday.

Latest River Heights:

Lockyer Ck at Helidon #	12.68m steady	03:02 PM MON 10/01/11
Flagstone Ck at Brown-Zirbels Rd *	3.49m falling	02:10 AM TUE 11/01/11
Sandy Creek at Sandy Creek Road #	2.15m falling	03:19 AM TUE 11/01/11
Ma Ma Ck at Harm's *	3.26m rising	02:30 AM TUE 11/01/11
Tenthill Ck at Tenthill *	5.57m rising	02:40 AM TUE 11/01/11
Lockyer Ck at Gatton #	18.92m rising	06:30 PM MON 10/01/11
Laidley Ck at Mulgowie *	6.39m rising	02:20 AM TUE 11/01/11
Laidley Ck at Laidley	8.7m falling slowly	10:00 PM MON 10/01/11
Laidley Ck at Showground Weir #	7.84m rising	03:25 AM TUE 11/01/11
Laidley Ck at Warrego Hwy *	6.41m rising	02:00 AM TUE 11/01/11
Lockyer Ck at Glenore Grove #	13.8m falling	03:24 AM TUE 11/01/11
Lockyer Ck at Lyons Br #	15.55m rising	03:23 AM TUE 11/01/11
Lockyer Ck at Rifle Range Rd *	15.39m rising	02:40 AM TUE 11/01/11

Lockyer Ck at O'Reilly's Weir # 18m falling 03:28 AM TUE 11/01/11

Brisbane R at Lowood Pump Stn # 15.93m falling 03:31 AM TUE 11/01/11

Brisbane R at Savages Crossing # 15.89m rising 03:29 AM TUE 11/01/11

Brisbane R at Burtons Br # 12.22m rising 03:29 AM TUE 11/01/11

Brisbane R at Kholo Br # 7.99m rising 03:29 AM TUE 11/01/11

Brisbane R at Mt Crosby # 15.82m steady 03:30 AM TUE 11/01/11

Brisbane R at Mt Crosby # 14.08m falling 04:39 PM MON 10/01/11

Brisbane R at Colleges Crossing # 13.91m rising 03:32 AM TUE 11/01/11

Bremer R at Rosewood# 5.56m falling 03:11 AM TUE 11/01/11

Bremer R at Five Mile Br Walloon # 6.4m rising 03:15 AM TUE 11/01/11

Warrill Ck at Greens Rd Amberley # 5.84m falling 03:29 AM TUE 11/01/11

Bremer R at One Mile Br # 13.75m rising 03:31 AM TUE 11/01/11

Bremer R at Hancocks Br Brassall # 11.33m rising 03:22 AM TUE 11/01/11

Bremer R at Ipswich # 8.55m rising 03:31 AM TUE 11/01/11

Brisbane R at Moggill # 7.07m rising 03:29 AM TUE 11/01/11

Brisbane R at Jindalee Br # 4.5m rising 03:29 AM TUE 11/01/11

Brisbane R at City Gauge # 1.4m falling 03:15 AM TUE 11/01/11

*automatic station

Warnings and River Height Bulletins are available at http://www.bom.gov.au/qld/flood/ . Flood Warnings are also available on telephone 1300 659 219 at a low call cost of 27.5 cents, more from mobile, public and satellite phones.

----------Safe Stamp----------

Your Anti-virus Service scanned this email. It is safe from known viruses.

For more information regarding this service, please contact your service provider.

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater


no lifeguards here
safe for life A WATER SAFETY INITIATIVE FROM seqwater
Swimming in weirs and fast flowing water is FATAL.
rethink it.

D415

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Tuesday, 11 January 2011 6:36 AM
To: Rob Drury; Dan Spiller [redacted]; Peter Borrows; [redacted]
Cc:
Subject: RE: Technical Report
Attachments: Technical Situation Report W38.docx

Attached is the latest report. Also below is the BoM warning with info on the Lockyer flood. The Somerset Council chambers had water through it and the library and they are working off site at the moment so communications with the Council may be impacted.

Basically the FOC was going to try to slow our releases last night to give a small window for the Lockyer flood to go through however we again received and are still receiving heavy rain in the catchments. Hence the best we can do at this stage is not increase releases.

Currently the FOC has shut some sluices at Somerset to store more water to keep Wivenhoe below RL74 at which we need to start increasing releases to ensure dam security and minimise downstream flood impacts if possible.

The strategy is now to keep releases at current levels so as to not worsen the situation downstream as the Lockyer recorded levels higher than any on record at some spots. However we may still need to increase releases depending on what happens through the day.

The FOC have given our release strategy (not really different in releases at this stage) to the BoM and they will reissue their flood warnings based on that and other flows in the Lockyer and Bremer and downstream.

The FOC have spoken to BCC and ICC and we will send them an update. BCC are having a LDMG meeting this morning.

Rob

From: Aifs Operational Manage[redacted]
Sent: Tuesday, January 11, 2011 4:06:54 AM
To: weather
Subject: BOM: FLDWARN for Lower Brisbane and Bremer Rs [SEC=UNCLASSIFIED] Auto forwarded by a Rule

TO::BOM615

IDQ20805

Australian Government Bureau of Meteorology Queensland

PRIORITY
FLOOD WARNING FOR THE LOCKYER, BREMER, WARRILL AND BRISBANE RIVER BELOW WIVENHOE INCLUDING BRISBANE CITY Issued at 4:06 AM on Tuesday the 11th of January 2011 by the Bureau of Meteorology, Brisbane.

The main flood waters in the Lockyer Creek are now arriving at Lyons Bridge, with strong stream rises expected during Tuesday.

Wivenhoe dam is providing significant mitigation of upper Brisbane floods. River flows from the Bremer and Lockyer catchments combined with releases from Wivenhoe dam are expected to increase levels in Brisbane during Tuesday.

At the Brisbane City Gauge, minor flood levels of about 2.1 metres are expected with the afternoon high tide on Tuesday and levels of about 3 metres are expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

LOCKYER CREEK:
Extremely heavy rainfall during Monday led to extreme rises in the Lockyer Creek catchment and Laidley Creek at Mulgowie. Record flood levels of 18.92 metres were recorded at Gatton Monday evening before the station failed. This level was well above the previous record peak of 16.33 metres from the February 1893 flood.

The main flood waters are currently arriving at Lyons Bridge, with strong stream rises expected in the next few hours. The Lockyer Creek at Glenore Grove peaked at 14.60 metres at 11:30pm, which is 0.3 metres below the 1974 flood.

Renewed stream rises have commenced in Lockyer Creek at Lyons Bridge with a peak between 16 and 16.5 metres expected Tuesday morning. This is likely to be similar in level to the 1996 flood.

BREMER RIVER:
The Bremer River at Walloon has exceeded the moderate flood level. The Bremer River at Rosewood peaked at 5.8 metres around midnight monday.

The Bremer River at Ipswich is expected to reach about 12.7 metres on Tuesday afternoon. Higher levels are possible.

WARRILL CREEK
Warrill Creek at Amberley peaked at 5.98 metres around 9pm Monday.

MIDDLE AND LOWER BRISBANE:
Moderate flooding is developing at Savages Crossing and at Mt Crosby Weir.

At the Brisbane City Gauge (lower end of Edward Street and at Thornton Street), minor flood levels of about 2.1 metres are expected with the afternoon high tide on Tuesday and levels of about 3 metres are expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Predicted River Heights/Flows:
Ipswich: Reach about 12.7 metres (major) during Tuesday afternoon.

Moggill: Reach about 12 metres (minor) during Tuesday afternoon.

Jindalee: Reach about 7 metres (minor) overnight Tuesday.

Brisbane: Reach about 2.1 metres (minor) with the afternoon high tide on Tuesday. Reach about 3 metres (moderate) with the high tides on Wednesday.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Further rises are possible at all four locations depending on further rain.

Next Issue:
The next warning will be issued at about 8am Tuesday.

Latest River Heights:

Lockyer Ck at Helidon #	12.68m steady	03:02 PM MON 10/01/11
Flagstone Ck at Brown-Zirbels Rd *	3.49m falling	02:10 AM TUE 11/01/11
Sandy Creek at Sandy Creek Road #	2.15m falling	03:19 AM TUE 11/01/11
Ma Ma Ck at Harm's *	3.26m rising	02:30 AM TUE 11/01/11
Tenthill Ck at Tenthill *	5.57m rising	02:40 AM TUE 11/01/11
Lockyer Ck at Gatton #	18.92m rising	06:30 PM MON 10/01/11
Laidley Ck at Mulgowie *	6.39m rising	02:20 AM TUE 11/01/11
Laidley Ck at Laidley	8.7m falling slowly	10:00 PM MON 10/01/11
Laidley Ck at Showground Weir #	7.84m rising	03:25 AM TUE 11/01/11
Laidley Ck at Warrego Hwy *	6.41m rising	02:00 AM TUE 11/01/11
Lockyer Ck at Glenore Grove #	13.8m falling	03:24 AM TUE 11/01/11
Lockyer Ck at Lyons Br #	15.55m rising	03:23 AM TUE 11/01/11
Lockyer Ck at Rifle Range Rd *	15.39m rising	02:40 AM TUE 11/01/11
Lockyer Ck at O'Reilly's Weir #	18m falling	03:28 AM TUE 11/01/11
Brisbane R at Lowood Pump Stn #	15.93m falling	03:31 AM TUE 11/01/11
Brisbane R at Savages Crossing #	15.89m rising	03:29 AM TUE 11/01/11
Brisbane R at Burtons Br #	12.22m rising	03:29 AM TUE 11/01/11
Brisbane R at Kholo Br #	7.99m rising	03:29 AM TUE 11/01/11
Brisbane R at Mt Crosby #	15.82m steady	03:30 AM TUE 11/01/11
Brisbane R at Mt Crosby #	14.08m falling	04:39 PM MON 10/01/11
Brisbane R at Colleges Crossing #	13.91m rising	03:32 AM TUE 11/01/11
Bremer R at Rosewood#	5.56m falling	03:11 AM TUE 11/01/11
Bremer R at Five Mile Br Walloon #	6.4m rising	03:15 AM TUE 11/01/11
Warrill Ck at Greens Rd Amberley #	5.84m falling	03:29 AM TUE 11/01/11
Bremer R at One Mile Br #	13.75m rising	03:31 AM TUE 11/01/11
Bremer R at Hancocks Br Brassall #	11.33m rising	03:22 AM TUE 11/01/11
Bremer R at Ipswich #	8.55m rising	03:31 AM TUE 11/01/11
Brisbane R at Moggill #	7.07m rising	03:29 AM TUE 11/01/11
Brisbane R at Jindalee Br #	4.5m rising	03:29 AM TUE 11/01/11
Brisbane R at City Gauge #	1.4m falling	03:15 AM TUE 11/01/11

*automatic station

Warnings and River Height Bulletins are available at http://www.bom.gov.au/qld/flood/ . Flood Warnings are also available on telephone 1300 659 219 at a low call cost of 27.5 cents, more from mobile, public and satellite phones.

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL

rethink it.

seqwater
WATER FOR LIFE

Ph ([redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W38	Date of TSR release	11.1.2011	Time of TSR release	6.30am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Maintain releases to keep Wivenhoe below RL74 at which significant releases need to be made to ensure the dam security and minimise flood impacts downstream if possible	
Strategy	• Maintain current release of 2750cumecs as long as possible but it may need to be increased • Close sluices at Somerset Dam to store more water however will affect upstream areas. •	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Rainfall continues in the North Pine Dam, Somerset Dam and Wivenhoe Dam catchments. Isolated falls in the Upper Brisbane River of up to 125 mm have been recorded with widespread falls of 40 to 70 mm in the Somerset Dam catchment. This rainfall will increase inflows into the dam.

There has also been 20 to 60 mm in the Lockyer Creek catchment in the last 12 hours with falls of up to 30 mm in the Bremer River.

A severe weather warning remains current for heavy rainfall in the dam catchment areas. The QPF issued by BOM at 16:00 estimates rainfalls for the 24 hours to 10:00 Tuesday as North Pine Dam (25mm to 50mm, with isolated falls to 100mm); Wivenhoe/Somerset Dam Catchments (25mm to 50mm, with isolated falls to 100mm).

North Pine Dam (Full Supply Level 39.60 m AHD)

The dam level is 39.80m AHD and has commenced rising again (storing 4,400ML above FSL). Five gates are open releasing 177 m3/s. The inflow into the dam since the commencement of the event is 77,000 ML. Estimated event volume is 88,000 ML assuming no further rainfall. Releases from the dam will continue until at least Wednesday 12 January 2011.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 103.27m AHD and falling slowly. Peak inflow to the dam is estimated to be about

4,200 m3/s. Total discharge into Wivenhoe Dam is currently 1400 m3/s and this discharge will be decreased in the next few hours to be around 500 m3/s later on Tuesday. This is to ensure that the combined flood mitigation capacity in Somerset and Wivenhoe Dam is maximized.

The dam level peaked at 103.52m AHD at 19:00 on Monday 10 January 2011, (unless further significant rainfall is experienced). Areas around Kilcoy will continue to be adversely affected.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

The dam level is 73.51m AHD and rising at about 25 mm/hour. Releases from the dam have been held at a rate of 2,750 m3/s since 19:30 hours on Monday 10 January 2011. Outflows into the Brisbane River from both Lockyer Creek and the Bremer River are also increasing.

The BoM has provided further advice about the flash flooding experienced in the upper areas of Lockyer Creek. The rainfall responsible for this event was not observed at any rainfall stations but it is considered to be extreme. Flood levels in the Lockyer Creek catchment will exceed maximum recorded levels in some stations in the upper catchment. This flow will result in increases in Brisbane River levels below the junction of Lockyer Creek.

Five radial gates are currently open at the dam releasing about 2,750m3/s into the Brisbane River. At this stage, the dam will reach just over 74.0m AHD during Tuesday evening.

Above EL 74.0m AHD the objective for dam operations is to maintain the security of the dam and minimise downstream flood flows if possible.

If further rainfall occurs, dam releases may need to be increased further and this may result in river flows in the lower Brisbane River approaching or exceeding 5,000m3/s.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer Creek flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Sunday 16 January in varying degrees.

Water levels in the lower Brisbane River will be impacted by the combined flows of Lockyer Creek, Bremer River, local runoff and releases from Wivenhoe Dam.

The BoM will provide further information regarding the magnitude of the flash flood event occurring in Lockyer Creek early Tuesday morning. Consideration was given to modifying the releases from Wivenhoe Dam to try to moderate the peak flows emanating from Lockyer Creek but the rainfall in the past 12 hours in the catchment above the dam makes this option not possible. Therefore instead of decreasing releases to accommodate the Lockyer Creek flows, the strategy will endeavour to maintain the current releases until Lockyer Creek peaks.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate over the next 24 hours. The flood operation centre will continue to monitor the situation and provide situation reports every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	11.1.2011	**Time**	PM	**or Event**	

[redacted]

From: [redacted]
Sent: Tuesday, 11 January 2011 6:47 AM
To: SEQWGM Media; Reception; [redacted] Barry Dennien; Dan Spille[redacted]
Cc: [redacted]
Subject: Release Update

Follow Up Flag: Follow up
Flag Status: Completed

Categories: T8

As at 7.00 am on Tuesday 11 January, the following applies:

SOMERSET DAM:
Water is being released into Wivenhoe; however the amount discharged can change as conditions change. Levels in omerset are expected to continue rising.

Areas around Kilcoy are likely to be impacted as a result of the rising dam levels.

WIVENHOE DAM:
Upstream levels are rising quickly as a result of significant heavy rainfall. The objective for dam operations will be to minimise the impact of urban flooding in areas downstream of the dam.

Releases through five gates have been held at around 236,000 megalitres a day since early Monday night 10 January as a result of outflows into the Brisbane River from the Lockyer Creek and Bremer River.

If further rainfall occurs, dam releases may need to be increased further.

Local Councils have been advised that as a result of Lockyer Creek flows, local runoff and Wivenhoe releases, Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge Colleges Crossing, Fernvale Bridge, and Mt Crosby Weir Bridge may be inundated until at Sunday 16 January.

NORTH PINE DAM:
Five gates are open, releasing around 15,000 megalitres a day and will continue until at least Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

LESLIE HARRISON DAM:
Gate releases are underway due to rainfall and inflows.

HINZE DAM:
A minor release of around 1200 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

For detailed information on road crossing closures and other potential impacts, always contact your local council.

This information will be updated during Tuesday 11 January.

[redacted]
Senior Communications Advisor
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]

Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au



Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Wall Terry [redacted]
Sent: Tuesday, 11 January 2011 7:49 AM
To: Dan Spiller
Subject: Re: Getting technical report

Follow Up Flag: Follow up
Flag Status: Completed

Categories: T8

Thanks Dan

----- Original Mess[redacted]
From: Dan Spiller [redacted]
To: Best Debbie; Wall Terry
Sent: Tue Jan 11 07:34:40 2011
Subject: Re: Getting technical report

Terry,

We are doing about 240,000 ML/day from the dam (2,750 cumecs). The remaining 1,250 cumecs is an allowance for other flows. Lockyer flows may exceed this allowance, but BoM is revising it's advice.

I am on [redacted]f you need more.

Dan

On 11/01/2011, at 7:21 AM, "Best Debbie" [redacted] wrote:

>
>
> ----- Original Message -----
> From: Wall Terry
> To: Best Debbie
> Sent: Tue Jan 11 06:57:08 2011
> Subject: RE: Getting technical report
>
> Thanks
>
> Does that equate to the 170,000ml per day in the media> Any advice on when they will go to 4000 mentioned in brief yesterday?
>
> -----Original Message-----
> From: Best Debbie
> Sent: Tuesday, 11 January 2011 6:55 AM
> To: Wall Terry
> Subject: Getting technical report
>
> Dan is sending more info. It was as I said at 74 those valves start going and they lose control of the releases. Theu r currently releasing 2,750 cm/sec
>
>
> +--+
> Think B4U Print
> 1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
> 3 sheets of A4 paper = 1 litre of water
> +--+

>

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

Litsupport Brisbane

From: Dan Spiller
Sent: Tuesday, 11 January 2011 7:17 AM
To: [redacted] 'Ken Smith [redacted]

Cc: Barry Dennien; [redacted] Rob Drury'; [redacted] 'Damien Brown [redacted]

Subject: Water Grid dam release strategy
Attachments: Technical Situation Report W38.docx

All,

Attached is the latest report, with the BoM warning on the Lockyer flood below.

Key points are:

- Current releases are 2,750 cubic metres per second (about 240,000 ML/day). Due to heavy rainfall in the catchment, it was not possible to reduce releases to allow the Lockyer Valley flows to pass.
- Further rainfall may result in the need to increase releases.
- Wivenhoe Dam is at 73.51m AHD and rising at about 25mm/hour. Above 74m, the primary objective becomes maintaining the security of the dam. Releases would be increased at this level with less scope for consideration of downstream impacts.

The BoM is remodeling based on this release strategy. There is some uncertainty about the level of flows coming from the Lockyer.

Please call me on [redacted] if you require any further information.

Debbie and Tim: I recommend that a briefing for the Minister would be appropriate, perhaps around 10am.

Regards,
Daniel Spiller

Australian Government Bureau of Meteorology Queensland

PRIORITY
FLOOD WARNING FOR THE LOCKYER, BREMER, WARRILL AND BRISBANE RIVER BELOW WIVENHOE INCLUDING BRISBANE CITY Issued at 4:06 AM on Tuesday the 11th of January 2011 by the Bureau of Meteorology, Brisbane.

The main flood waters in the Lockyer Creek are now arriving at Lyons Bridge, with strong stream rises expected during Tuesday.

Wivenhoe dam is providing significant mitigation of upper Brisbane floods. River flows from the Bremer and Lockyer catchments combined with releases from Wivenhoe dam are expected to increase levels in Brisbane during Tuesday.

At the Brisbane City Gauge, minor flood levels of about 2.1 metres are expected with the afternoon high tide on Tuesday and levels of about 3 metres are expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

LOCKYER CREEK:
Extremely heavy rainfall during Monday led to extreme rises in the Lockyer Creek catchment and Laidley Creek at Mulgowie. Record flood levels of 18.92 metres were recorded at Gatton Monday evening before the station failed. This level was well above the previous record peak of 16.33 metres from the February 1893 flood.

The main flood waters are currently arriving at Lyons Bridge, with strong stream rises expected in the next few hours. The Lockyer Creek at Glenore Grove peaked at 14.60 metres at 11:30pm, which is 0.3 metres below the 1974 flood.

Renewed stream rises have commenced in Lockyer Creek at Lyons Bridge with a peak between 16 and 16.5 metres expected Tuesday morning. This is likely to be similar in level to the 1996 flood.

BREMER RIVER:
ne Bremer River at Walloon has exceeded the moderate flood level. The Bremer River at Rosewood peaked at 5.8 metres around midnight monday.

The Bremer River at Ipswich is expected to reach about 12.7 metres on Tuesday afternoon. Higher levels are possible.

WARRILL CREEK
Warrill Creek at Amberley peaked at 5.98 metres around 9pm Monday.

MIDDLE AND LOWER BRISBANE:
Moderate flooding is developing at Savages Crossing and at Mt Crosby Weir.

At the Brisbane City Gauge (lower end of Edward Street and at Thornton Street), minor flood levels of about 2.1 metres are expected with the afternoon high tide on Tuesday and levels of about 3 metres are expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

redicted River Heights/Flows:
Ipswich: Reach about 12.7 metres (major) during Tuesday afternoon.

Moggill: Reach about 12 metres (minor) during Tuesday afternoon.

Jindalee: Reach about 7 metres (minor) overnight Tuesday.

Brisbane: Reach about 2.1 metres (minor) with the afternoon high tide on Tuesday. Reach about 3 metres (moderate) with the high tides on Wednesday.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Further rises are possible at all four locations depending on further rain.

Next Issue:

The next warning will be issued at about 8am Tuesday.

Latest River Heights:

Lockyer Ck at Helidon #	12.68m steady	03:02 PM MON 10/01/11
Flagstone Ck at Brown-Zirbels Rd *	3.49m falling	02:10 AM TUE 11/01/11
Sandy Creek at Sandy Creek Road #	2.15m falling	03:19 AM TUE 11/01/11
Ma Ma Ck at Harm's *	3.26m rising	02:30 AM TUE 11/01/11
Tenthill Ck at Tenthill *	5.57m rising	02:40 AM TUE 11/01/11
Lockyer Ck at Gatton #	18.92m rising	06:30 PM MON 10/01/11
Laidley Ck at Mulgowie *	6.39m rising	02:20 AM TUE 11/01/11
Laidley Ck at Laidley	8.7m falling slowly	10:00 PM MON 10/01/11
Laidley Ck at Showground Weir #	7.84m rising	03:25 AM TUE 11/01/11
Laidley Ck at Warrego Hwy *	6.41m rising	02:00 AM TUE 11/01/11
Lockyer Ck at Glenore Grove #	13.8m falling	03:24 AM TUE 11/01/11
Lockyer Ck at Lyons Br #	15.55m rising	03:23 AM TUE 11/01/11
Lockyer Ck at Rifle Range Rd *	15.39m rising	02:40 AM TUE 11/01/11
Lockyer Ck at O'Reilly's Weir #	18m falling	03:28 AM TUE 11/01/11
Brisbane R at Lowood Pump Stn #	15.93m falling	03:31 AM TUE 11/01/11
Brisbane R at Savages Crossing #	15.89m rising	03:29 AM TUE 11/01/11
Brisbane R at Burtons Br #	12.22m rising	03:29 AM TUE 11/01/11
Brisbane R at Kholo Br #	7.99m rising	03:29 AM TUE 11/01/11
risbane R at Mt Crosby #	15.82m steady	03:30 AM TUE 11/01/11
Brisbane R at Mt Crosby #	14.08m falling	04:39 PM MON 10/01/11
Brisbane R at Colleges Crossing #	13.91m rising	03:32 AM TUE 11/01/11
Bremer R at Rosewood#	5.56m falling	03:11 AM TUE 11/01/11
Bremer R at Five Mile Br Walloon #	6.4m rising	03:15 AM TUE 11/01/11
Warrill Ck at Greens Rd Amberley #	5.84m falling	03:29 AM TUE 11/01/11
Bremer R at One Mile Br #	13.75m rising	03:31 AM TUE 11/01/11
Bremer R at Hancocks Br Brassall #	11.33m rising	03:22 AM TUE 11/01/11
Bremer R at Ipswich #	8.55m rising	03:31 AM TUE 11/01/11
Brisbane R at Moggill #	7.07m rising	03:29 AM TUE 11/01/11
Brisbane R at Jindalee Br #	4.5m rising	03:29 AM TUE 11/01/11
Brisbane R at City Gauge #	1.4m falling	03:15 AM TUE 11/01/11

*automatic station

Warnings and River Height Bulletins are available at http://www.bom.gov.au/qld/flood/ . Flood Warnings are also available on telephone 1300 659 219 at a low call cost of 27.5 cents, more from mobile, public and satellite phones.

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W38	Date of TSR release	11.1.2011	Time of TSR release	6.30am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Maintain releases to keep Wivenhoe below RL74 at which significant releases need to be made to ensure the dam security and minimise flood impacts downstream if possible	
Strategy	• Maintain current release of 2750cumecs as long as possible but it may need to be increased • Close sluices at Somerset Dam to store more water however will affect upstream areas. •	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Rainfall continues in the North Pine Dam, Somerset Dam and Wivenhoe Dam catchments. Isolated falls in the Upper Brisbane River of up to 125 mm have been recorded with widespread falls of 40 to 70 mm in the Somerset Dam catchment. This rainfall will increase inflows into the dam.

There has also been 20 to 60 mm in the Lockyer Creek catchment in the last 12 hours with falls of up to 30 mm in the Bremer River.

A severe weather warning remains current for heavy rainfall in the dam catchment areas. The QPF issued by BOM at 16:00 estimates rainfalls for the 24 hours to 10:00 Tuesday as North Pine Dam (25mm to 50mm, with isolated falls to 100mm); Wivenhoe/Somerset Dam Catchments (25mm to 50mm, with isolated falls to 100mm).

North Pine Dam (Full Supply Level 39.60 m AHD)

The dam level is 39.80m AHD and has commenced rising again (storing 4,400ML above FSL). Five gates are open releasing 177 m3/s. The inflow into the dam since the commencement of the event is 77,000 ML. Estimated event volume is 88,000 ML assuming no further rainfall. Releases from the dam will continue until at least Wednesday 12 January 2011.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 103.27m AHD and falling slowly. Peak inflow to the dam is estimated to be about

4,200 m3/s. Total discharge into Wivenhoe Dam is currently 1400 m3/s and this discharge will be decreased in the next few hours to be around 500 m3/s later on Tuesday. This is to ensure that the combined flood mitigation capacity in Somerset and Wivenhoe Dam is maximized.

The dam level peaked at 103.52m AHD at 19:00 on Monday 10 January 2011, (unless further significant rainfall is experienced). Areas around Kilcoy will continue to be adversely affected.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

The dam level is 73.51m AHD and rising at about 25 mm/hour. Releases from the dam have been held at a rate of 2,750 m3/s since 19:30 hours on Monday 10 January 2011. Outflows into the Brisbane River from both Lockyer Creek and the Bremer River are also increasing.

The BoM has provided further advice about the flash flooding experienced in the upper areas of Lockyer Creek. The rainfall responsible for this event was not observed at any rainfall stations but it is considered to be extreme. Flood levels in the Lockyer Creek catchment will exceed maximum recorded levels in some stations in the upper catchment. This flow will result in increases in Brisbane River levels below the junction of Lockyer Creek.

Five radial gates are currently open at the dam releasing about 2,750m3/s into the Brisbane River. At this stage, the dam will reach just over 74.0m AHD during Tuesday evening.

Above EL 74.0m AHD the objective for dam operations is to maintain the security of the dam and minimise downstream flood flows if possible.

If further rainfall occurs, dam releases may need to be increased further and this may result in river flows in the lower Brisbane River approaching or exceeding 5,000m3/s.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer Creek flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Sunday 16 January in varying degrees.

Water levels in the lower Brisbane River will be impacted by the combined flows of Lockyer Creek, Bremer River, local runoff and releases from Wivenhoe Dam.

The BoM will provide further information regarding the magnitude of the flash flood event occurring in Lockyer Creek early Tuesday morning. Consideration was given to modifying the releases from Wivenhoe Dam to try to moderate the peak flows emanating from Lockyer Creek but the rainfall in the past 12 hours in the catchment above the dam makes this option not possible. Therefore instead of decreasing releases to accommodate the Lockyer Creek flows, the strategy will endeavour to maintain the current releases until Lockyer Creek peaks.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate over the next 24 hours. The flood operation centre will continue to monitor the situation and provide situation reports every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	[redacted]

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	11.1.2011	**Time**	PM	**or Event**	

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Tuesday, 11 January 2011 7:58 AM
To: Dan Spiller
Subject: Re: Technical Report

Wiv. 173% Som 160%

From: Dan Spiller [redacted]
To: Rob Drury
Sent: Tue Jan 11 07:47:51 2011
Subject: RE: Technical Report

Rob,

Can you please urgently provide dam levels as percentage?

Dan

From: Rob Drury [redacted]
Sent: Tuesday, 11 January 2011 6:36 AM
To: Rob Drury; Dan Spiller; [redacted] Peter Borrows; [redacted]
Cc: [redacted]
Subject: RE: Technical Report

Attached is the latest report. Also below is the BoM warning with info on the Lockyer flood. The Somerset Council chambers had water through it and the library and they are working off site at the moment so communications with the Council may be impacted.

Basically the FOC was going to try to slow our releases last night to give a small window for the Lockyer flood to go through however we again received and are still receiving heavy rain in the catchments. Hence the best we can do at this stage is not increase releases.

Currently the FOC has shut some sluices at Somerset to store more water to keep Wivenhoe below RL74 at which we need to start increasing releases to ensure dam security and minimise downstream flood impacts if possible.

The strategy is now to keep releases at current levels so as to not worsen the situation downstream as the Lockyer recorded levels higher than any on record at some spots. However we may still need to increase releases depending on what happens through the day.

The FOC have given our release strategy (not really different in releases at this stage) to the BoM and they will reissue their flood warnings based on that and other flows in the Lockyer and Bremer and downstream.

The FOC have spoken to BCC and ICC and we will send them an update. BCC are having a LDMG meeting this morning.

Rob

From: Aifs Operational Manager [redacted]
Sent: Tuesday, January 11, 201[redacted]

To: weather
Subject: BOM: FLDWARN for Lower Brisbane and Bremer Rs [SEC=UNCLASSIFIED] Auto forwarded by a Rule

TO::BOM615

IDQ20805

Australian Government Bureau of Meteorology Queensland

PRIORITY
FLOOD WARNING FOR THE LOCKYER, BREMER, WARRILL AND BRISBANE RIVER BELOW WIVENHOE INCLUDING BRISBANE CITY Issued at 4:06 AM on Tuesday the 11th of January 2011 by the Bureau of Meteorology, Brisbane.

The main flood waters in the Lockyer Creek are now arriving at Lyons Bridge, with strong stream rises expected during Tuesday.

Wivenhoe dam is providing significant mitigation of upper Brisbane floods. River flows from the Bremer and Lockyer catchments combined with releases from Wivenhoe dam are expected to increase levels in Brisbane during Tuesday.

At the Brisbane City Gauge, minor flood levels of about 2.1 metres are expected with the afternoon high tide on Tuesday and levels of about 3 metres are expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

LOCKYER CREEK:
Extremely heavy rainfall during Monday led to extreme rises in the Lockyer Creek catchment and Laidley Creek at Mulgowie. Record flood levels of 18.92 metres were recorded at Gatton Monday evening before the station failed. This level was well above the previous record peak of 16.33 metres from the February 1893 flood.

The main flood waters are currently arriving at Lyons Bridge, with strong stream rises expected in the next few hours. The Lockyer Creek at Glenore Grove peaked at 14.60 metres at 11:30pm, which is 0.3 metres below the 1974 flood.

Renewed stream rises have commenced in Lockyer Creek at Lyons Bridge with a peak between 16 and 16.5 metres expected Tuesday morning. This is likely to be similar in level to the 1996 flood.

BREMER RIVER:
The Bremer River at Walloon has exceeded the moderate flood level. The Bremer River at Rosewood peaked at 5.8 metres around midnight monday.

The Bremer River at Ipswich is expected to reach about 12.7 metres on Tuesday afternoon. Higher levels are possible.

WARRILL CREEK
Warrill Creek at Amberley peaked at 5.98 metres around 9pm Monday.

MIDDLE AND LOWER BRISBANE:
Moderate flooding is developing at Savages Crossing and at Mt Crosby Weir.

At the Brisbane City Gauge (lower end of Edward Street and at Thornton Street), minor flood levels of about 2.1 metres are expected with the afternoon high tide on Tuesday and levels of about 3 metres are expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Predicted River Heights/Flows:
Ipswich: Reach about 12.7 metres (major) during Tuesday afternoon.

Moggill: Reach about 12 metres (minor) during Tuesday afternoon.

Jindalee: Reach about 7 metres (minor) overnight Tuesday.

Brisbane: Reach about 2.1 metres (minor) with the afternoon high tide on Tuesday. Reach about 3 metres (moderate) with the high tides on Wednesday.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Further rises are possible at all four locations depending on further rain.

Next Issue:
The next warning will be issued at about 8am Tuesday.

Latest River Heights:

Lockyer Ck at Helidon #	12.68m steady	03:02 PM MON 10/01/11
Flagstone Ck at Brown-Zirbels Rd *	3.49m falling	02:10 AM TUE 11/01/11
Sandy Creek at Sandy Creek Road #	2.15m falling	03:19 AM TUE 11/01/11
Ma Ma Ck at Harm's *	3.26m rising	02:30 AM TUE 11/01/11
Tenthill Ck at Tenthill *	5.57m rising	02:40 AM TUE 11/01/11
Lockyer Ck at Gatton #	18.92m rising	06:30 PM MON 10/01/11
Laidley Ck at Mulgowie *	6.39m rising	02:20 AM TUE 11/01/11
Laidley Ck at Laidley	8.7m falling slowly	10:00 PM MON 10/01/11
Laidley Ck at Showground Weir #	7.84m rising	03:25 AM TUE 11/01/11
Laidley Ck at Warrego Hwy *	6.41m rising	02:00 AM TUE 11/01/11
Lockyer Ck at Glenore Grove #	13.8m falling	03:24 AM TUE 11/01/11
Lockyer Ck at Lyons Br #	15.55m rising	03:23 AM TUE 11/01/11
Lockyer Ck at Rifle Range Rd *	15.39m rising	02:40 AM TUE 11/01/11
Lockyer Ck at O'Reilly's Weir #	18m falling	03:28 AM TUE 11/01/11
Brisbane R at Lowood Pump Stn #	15.93m falling	03:31 AM TUE 11/01/11
Brisbane R at Savages Crossing #	15.89m rising	03:29 AM TUE 11/01/11
Brisbane R at Burtons Br #	12.22m rising	03:29 AM TUE 11/01/11
Brisbane R at Kholo Br #	7.99m rising	03:29 AM TUE 11/01/11
Brisbane R at Mt Crosby #	15.82m steady	03:30 AM TUE 11/01/11
Brisbane R at Mt Crosby #	14.08m falling	04:39 PM MON 10/01/11
Brisbane R at Colleges Crossing #	13.91m rising	03:32 AM TUE 11/01/11
Bremer R at Rosewood#	5.56m falling	03:11 AM TUE 11/01/11
Bremer R at Five Mile Br Walloon #	6.4m rising	03:15 AM TUE 11/01/11
Warrill Ck at Greens Rd Amberley #	5.84m falling	03:29 AM TUE 11/01/11
Bremer R at One Mile Br #	13.75m rising	03:31 AM TUE 11/01/11
Bremer R at Hancocks Br Brassall #	11.33m rising	03:22 AM TUE 11/01/11
Bremer R at Ipswich #	8.55m rising	03:31 AM TUE 11/01/11
Brisbane R at Moggill #	7.07m rising	03:29 AM TUE 11/01/11
Brisbane R at Jindalee Br #	4.5m rising	03:29 AM TUE 11/01/11
Brisbane R at City Gauge #	1.4m falling	03:15 AM TUE 11/01/11

*automatic station

Warnings and River Height Bulletins are available at http://www.bom.gov.au/qld/flood/ . Flood Warnings are also available on telephone 1300 659 219 at a low call cost of 27.5 cents, more from mobile, public and satellite phones.

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Dan Spiller

From: [redacted]
Sent: Tuesday, 11 January 2011 8:09 AM
To: Dan Spiller
Subject: FW: Fw: inclusion of detail on consequence of fuse plug activation in the reports prepared under the Wivenhoe/Somerset protocol

Hi Dan

FYI

Regards

[redacted]

-----[redacted]
From: [redacted]
Sent: Tuesday, 11 January 2011 6:22 AM
To: [redacted]
Cc: [redacted]
Subject: Re: Fw: inclusion of detail on consequence of fuse plug activation in the reports prepared under the Wivenhoe/Somerset protocol

[redacted]

As [redacted] has indicated below, there seems to be some confusion over the fuse plug spillway and the role it plays in ensuring the safety of the dam. We would recommend that something along the following lines be included in the next Technical Report to inform this discussion. Perhaps the Duty Engineers might check to see if they are happy with the wording ...

".. A safety feature of Wivenhoe Dam is its 3 bay fuse plug auxilliary spillway which is designed to progressively fail as the storage level in the dam rises above EL75.5 metres. Once the trigger level for each bay is reached, the bay is designed to fail over a relatively short period of time and this significantly increases the dischage capacity of the dam. While this feature helps ensure the dam does not collapse in a rare extreme flood event, its activation has a number of flooding consequences:

* when a bay fails, the downstream flood levels may see relatively rapid rises. For instance, the rapidly increased total spillway flow is likely to cause a sudden rise of about 0.5 metres at Ipswich. The flood level rise would be slightly higher upstream and lower downstream. This would be on top of the already high flood levels prior to the fuse plug triggering.

* until the fuse plug is reinstated, and this might not be able to be done for some months, the ability to closely manage the types of flood events seen before Christmas 2010 would be significantly reduced, as the floodwater would basically discharge in an uncontrolled manner through the gap created by the fuse plug activation.

The current flood release strategy will probably see the dam reaching EL ?? metres, so there is not a sigificnant capacity to reduce flood releases...."

From: [redacted]
Sent: Tuesday, 11 January 2011 8:23 AM
To: [redacted]
Subject: Please call

Colin,

I rang but missed you. I need to give you a brief update on Wivenhoe operations.

Dam level has continued to increase despite increased releases, and is now at 173% and rising due to heavy rainfall in the catchment.

It is now at 73.51m AHD and approaching 74m AHD, which is the level at which dam safety becomes the primary objective.

We will need to increase releases to seek to avoid reaching this level. Seqwater should be speaking to your staff and providing updated information to BoM to model.

Increases should occur after the Lockyer flows have peaked.

Dan

Daniel Spiller
Director, Operations
SEQ W[redacted]
Phone
Email:
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: Best Debbie [redacted]
Sent: Tuesday, 11 January 2011 10:31 AM
To: Dan Spiller
Subject: Fw: Water Grid dam release strategy
Attachments: image001.jpg; image002.png; Technical Situation Report W38.docx; ATT33793.txt

----- Original Message -----
From: Peter Borrows [redacted]
To: [redacted]
Cc: [redacted]; Best Debbie
Sent: Tue Jan 11 07:27:40 2011
Subject: Fw: Water Grid dam release strategy

Barry an you try and get this briefing at 10.30 please.

From: Dan Spiller [redacted]; 'Ken Smith
[redacted]
Cc: Barry Dennien [redacted]; Peter Borrows; Rob Drury; [redacted]; 'Damien Brown
[redacted]
Sent: Tue Jan 11 07:16:44 2011
Subject: Water Grid dam release strategy

All,

Attached is the latest report, with the BoM warning on the Lockyer flood below.

Key points are:

- Current releases are 2,750 cubic metres per second (about 240,000 ML/day). Due to heavy rainfall in the catchment, it was not possible to reduce releases to allow the Lockyer Valley flows to pass.
- Further rainfall may result in the need to increase releases.
- Wivenhoe Dam is at 73.51m AHD and rising at about 25mm/hour. Above 74m, the primary objective becomes maintaining the security of the dam. Releases would be increased at this level with less scope for consideration of downstream impacts.

The BoM is remodeling based on this release strategy. There is some uncertainty about the level of flows coming from the Lockyer.

Please call me on [redacted] if you require any further information.

Debbie and Tim: I recommend that a briefing for the Minister would be appropriate, perhaps around 10am.

Regards,

Daniel Spiller

Australian Government Bureau of Meteorology Queensland

PRIORITY

FLOOD WARNING FOR THE LOCKYER, BREMER, WARRILL AND BRISBANE RIVER BELOW WIVENHOE INCLUDING BRISBANE CITY Issued at 4:06 AM on Tuesday the 11th of January 2011 by the Bureau of Meteorology, Brisbane.

The main flood waters in the Lockyer Creek are now arriving at Lyons Bridge, with strong stream rises expected during Tuesday.

Wivenhoe dam is providing significant mitigation of upper Brisbane floods. River flows from the Bremer and Lockyer catchments combined with releases from Wivenhoe dam are expected to increase levels in Brisbane during Tuesday.

At the Brisbane City Gauge, minor flood levels of about 2.1 metres are expected with the afternoon high tide on Tuesday and leve' of about 3 metres are expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

LOCKYER CREEK:

Extremely heavy rainfall during Monday led to extreme rises in the Lockyer Creek catchment and Laidley Creek at Mulgowie. Record flood levels of 18.92 metres were recorded at Gatton Monday evening before the station failed. This level was well above the previous record peak of 16.33 metres from the February 1893 flood.

The main flood waters are currently arriving at Lyons Bridge, with strong stream rises expected in the next few hours. The Lockyer Creek at Glenore Grove peaked at 14.60 metres at 11:30pm, which is 0.3 metres below the 1974 flood.

Renewed stream rises have commenced in Lockyer Creek at Lyons Bridge with a peak between 16 and 16.5 metres expected Tuesday morning. This is likely to be similar in level to the 1996 flood.

BREMER RIVER:

The Bremer River at Walloon has exceeded the moderate flood level. The Bremer River at Rosewood peaked at 5.8 metres around midnight monday.

The Bremer River at Ipswich is expected to reach about 12.7 metres on Tuesday afternoon. Higher levels are possible.

WARRILL CREEK

Warrill Creek at Amberley peaked at 5.98 metres around 9pm Monday.

MIDDLE AND LOWER BRISBANE:

Moderate flooding is developing at Savages Crossing and at Mt Crosby Weir.

At the Brisbane City Gauge (lower end of Edward Street and at Thornton Street), minor flood levels of about 2.1 metres are expected with the afternoon high tide on Tuesday and levels of about 3 metres are expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Predicted River Heights/Flows:

.pswich: Reach about 12.7 metres (major) during Tuesday afternoon.

Moggill: Reach about 12 metres (minor) during Tuesday afternoon.

Jindalee: Reach about 7 metres (minor) overnight Tuesday.

Brisbane: Reach about 2.1 metres (minor) with the afternoon high tide on Tuesday. Reach about 3 metres (moderate) with the high tides on Wednesday.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Further rises are possible at all four locations depending on further rain.

Next Issue:

The next warning will be issued at about 8am Tuesday.

Latest River Heights:

Lockyer Ck at Helidon #	12.68m steady	03:02 PM MON 10/01/11
Flagstone Ck at Brown-Zirbels Rd *	3.49m falling	02:10 AM TUE 11/01/11
Sandy Creek at Sandy Creek Road #	2.15m falling	03:19 AM TUE 11/01/11
Ma Ma Ck at Harm's *	3.26m rising	02:30 AM TUE 11/01/11
Tenthill Ck at Tenthill *	5.57m rising	02:40 AM TUE 11/01/11
Lockyer Ck at Gatton #	18.92m rising	06:30 PM MON 10/01/11
Laidley Ck at Mulgowie *	6.39m rising	02:20 AM TUE 11/01/11
Laidley Ck at Laidley	8.7m falling slowly	10:00 PM MON 10/01/11
Laidley Ck at Showground Weir #	7.84m rising	03:25 AM TUE 11/01/11
Laidley Ck at Warrego Hwy *	6.41m rising	02:00 AM TUE 11/01/11
Lockyer Ck at Glenore Grove #	13.8m falling	03:24 AM TUE 11/01/11
Lockyer Ck at Lyons Br #	15.55m rising	03:23 AM TUE 11/01/11
Lockyer Ck at Rifle Range Rd *	15.39m rising	02:40 AM TUE 11/01/11
Lockyer Ck at O'Reilly's Weir #	18m falling	03:28 AM TUE 11/01/11
Brisbane R at Lowood Pump Stn #	15.93m falling	03:31 AM TUE 11/01/11
Brisbane R at Savages Crossing #	15.89m rising	03:29 AM TUE 11/01/11
Brisbane R at Burtons Br #	12.22m rising	03:29 AM TUE 11/01/11
Brisbane R at Kholo Br #	7.99m rising	03:29 AM TUE 11/01/11
Brisbane R at Mt Crosby #	15.82m steady	03:30 AM TUE 11/01/11
Brisbane R at Mt Crosby #	14.08m falling	04:39 PM MON 10/01/11
Brisbane R at Colleges Crossing #	13.91m rising	03:32 AM TUE 11/01/11
Bremer R at Rosewood#	5.56m falling	03:11 AM TUE 11/01/11

Bremer R at Five Mile Br Walloon # 6.4m rising 03:15 AM TUE 11/01/11

Warrill Ck at Greens Rd Amberley # 5.84m falling 03:29 AM TUE 11/01/11

Bremer R at One Mile Br # 13.75m rising 03:31 AM TUE 11/01/11

Bremer R at Hancocks Br Brassall # 11.33m rising 03:22 AM TUE 11/01/11

Bremer R at Ipswich # 8.55m rising 03:31 AM TUE 11/01/11

Brisbane R at Moggill # 7.07m rising 03:29 AM TUE 11/01/11

Brisbane R at Jindalee Br # 4.5m rising 03:29 AM TUE 11/01/11

Brisbane R at City Gauge # 1.4m falling 03:15 AM TUE 11/01/11

*automatic station

Warnings and River Height Bulletins are available at http://www.bom.gov.au/qld/flood/ . Flood Warnings are also available on telephone 1300 659 219 at a low call cost of 27.5 cents, more from mobile, public and satellite phones.

----------Safe Stamp----------

Your Anti-virus Service scanned this email. It is safe from <<image001.jpg>> known viruses.

F <<image002.png>> or more information regarding this service, please contact your service provider.

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority trading as Seqwater

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au <http://www.seqwater.com.au/>

Important information: This email and any attached information is intended only for the addressee and may contain confidential

and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

+--+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+--+

TECHNICAL SITUATION REPORT

TSR Number	W38	Date of TSR release	11.1.2011	Time of TSR release	6.30am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Maintain releases to keep Wivenhoe below RL74 at which significant releases need to be made to ensure the dam security and minimise flood impacts downstream if possible	
Strategy	• Maintain current release of 2750cumecs as long as possible but it may need to be increased • Close sluices at Somerset Dam to store more water however will affect upstream areas. •	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Rainfall continues in the North Pine Dam, Somerset Dam and Wivenhoe Dam catchments. Isolated falls in the Upper Brisbane River of up to 125 mm have been recorded with widespread falls of 40 to 70 mm in the Somerset Dam catchment. This rainfall will increase inflows into the dam.

There has also been 20 to 60 mm in the Lockyer Creek catchment in the last 12 hours with falls of up to 30 mm in the Bremer River.

A severe weather warning remains current for heavy rainfall in the dam catchment areas. The QPF issued by BOM at 16:00 estimates rainfalls for the 24 hours to 10:00 Tuesday as North Pine Dam (25mm to 50mm, with isolated falls to 100mm); Wivenhoe/Somerset Dam Catchments (25mm to 50mm, with isolated falls to 100mm).

North Pine Dam (Full Supply Level 39.60 m AHD)

The dam level is 39.80m AHD and has commenced rising again (storing 4,400ML above FSL). Five gates are open releasing 177 m3/s. The inflow into the dam since the commencement of the event is 77,000 ML. Estimated event volume is 88,000 ML assuming no further rainfall. Releases from the dam will continue until at least Wednesday 12 January 2011.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 103.27m AHD and falling slowly. Peak inflow to the dam is estimated to be about

4,200 m3/s. Total discharge into Wivenhoe Dam is currently 1400 m3/s and this discharge will be decreased in the next few hours to be around 500 m3/s later on Tuesday. This is to ensure that the combined flood mitigation capacity in Somerset and Wivenhoe Dam is maximized.

The dam level peaked at 103.52m AHD at 19:00 on Monday 10 January 2011, (unless further significant rainfall is experienced). Areas around Kilcoy will continue to be adversely affected.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

The dam level is 73.51m AHD and rising at about 25 mm/hour. Releases from the dam have been held at a rate of 2,750 m3/s since 19:30 hours on Monday 10 January 2011. Outflows into the Brisbane River from both Lockyer Creek and the Bremer River are also increasing.

The BoM has provided further advice about the flash flooding experienced in the upper areas of Lockyer Creek. The rainfall responsible for this event was not observed at any rainfall stations but it is considered to be extreme. Flood levels in the Lockyer Creek catchment will exceed maximum recorded levels in some stations in the upper catchment. This flow will result in increases in Brisbane River levels below the junction of Lockyer Creek.

Five radial gates are currently open at the dam releasing about 2,750m3/s into the Brisbane River. At this stage, the dam will reach just over 74.0m AHD during Tuesday evening.

Above EL 74.0m AHD the objective for dam operations is to maintain the security of the dam and minimise downstream flood flows if possible.

If further rainfall occurs, dam releases may need to be increased further and this may result in river flows in the lower Brisbane River approaching or exceeding 5,000m3/s.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer Creek flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Sunday 16 January in varying degrees.

Water levels in the lower Brisbane River will be impacted by the combined flows of Lockyer Creek, Bremer River, local runoff and releases from Wivenhoe Dam.

The BoM will provide further information regarding the magnitude of the flash flood event occurring in Lockyer Creek early Tuesday morning. Consideration was given to modifying the releases from Wivenhoe Dam to try to moderate the peak flows emanating from Lockyer Creek but the rainfall in the past 12 hours in the catchment above the dam makes this option not possible. Therefore instead of decreasing releases to accommodate the Lockyer Creek flows, the strategy will endeavour to maintain the current releases until Lockyer Creek peaks.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate over the next 24 hours. The flood operation centre will continue to monitor the situation and provide situation reports every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	[redacted]

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	11.1.2011	**Time**	PM	**or Event**	

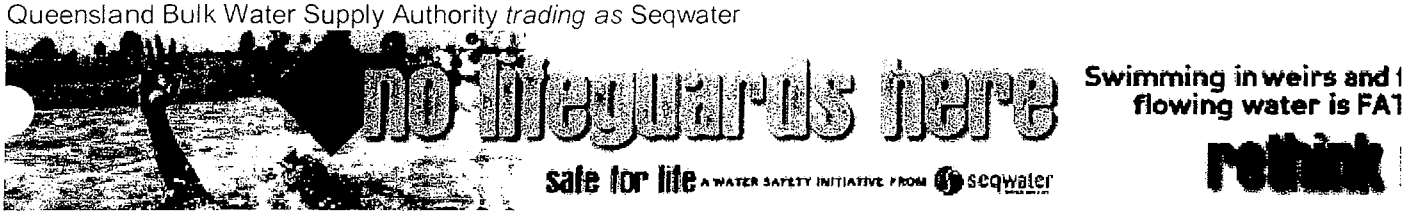
[redacted]

From: Rob Drury [redacted]
Sent: Tuesday, 11 January 2011 9:51 PM
To: Dan Spiller
Subject: RE: Technical Report
Attachments: image001.jpg; image002.png; Technical Situation Report W44.docx

Dan,
Updated report.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Dan Spiller [redacted]
Sent: Tuesday, 11 January 2011 9:33 PM
To: Rob Drury
Subject: Re: Technical Report

Sorry, I meant release rates. You note the closure sequence, but not from what.

On 11/01/2011, at 9:31 PM, "Rob Drury" <[redacted] wrote:

> Sure,
>
> I had the volumes of the dams in there, which volumes did you mean?
>
> Rob

D452

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.jpg>

<image002.png>

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

From: Dan Spiller [redacted]
Sent: Tuesday, 11 January 2011 9:28 PM
To: Rob Drury
Subject: Re: Technical Report

Rob,

We will distribute this version widely. Can you pls update to state volumes?

Dan

On 11/01/2011, at 9:15 PM, "Rob Drury" [redacted] wrote:

> Attached report.
>
> Dam has peaked (assuming no more rain) and release reduction has been initiated.

Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.jpg>

<image002.png>

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

<Technical Situation Report W44.docx>

This email, together with any attachments, is intended for the named recipient(s) only, and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it: any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only: and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it: any form of disclosure, modification distribution and/or publication of this email is also prohibited.
While all care has been taken the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any nsmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W44	Date of TSR release	11.1.2011	Time of TSR release	8pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Initiate the gradual reduction of releases.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Maintain controlled releases. • Keep sluices closed at Somerset Dam to store more water however will affect upstream areas.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 1,500,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset/Wivenhoe

Our strategy revolves ensuring dam security and is around trying to prevent initiation of the first fuse plug at EL 75.6m. If this happens we will get a rapid increase of about 2,000m3/s in outflow from the dam in addition to the gate release which could be as high as 10,000m3/s at the time.

Sluices have been closed at Somerset and this will result in high upstream water levels affecting Kilcoy. Somerset is at 104.78m holding 697,400ML and 183.6%.

Somerset should peak at around 105.2m (1974 peak level was 106.5m).

At 2100 Wivenhoe Dam was 74.95m AHD holding 2,223,000ML and 190.8% and slowly dropping.

The levels have now stabilized and commenced to fall slowly.

The FOC has begun an appropriate closure sequence to reduce releases.
Releases will be reduced slowly throughout the night to track dropping levels. First reduction will be to around 7,100cumecs.

Assuming no further rain, the dam has now peaked around 74.97m AHD which was around 600mm below the first fuse plug initiation level.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is also maintaining close contact with warning agencies and local councils.

It should be noted that the flow in the lower Brisbane R in 1974 was about 9,500m3/s

North Pine Dam:
Five gates are open and continuing to drop. Releases may still continue until Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time	PM	or Event	

Litsupport Brisbane

From: [redacted]
Sent: Tuesday, 11 January 2011 12:46 PM
To: Dan Spiller; SEQWGM Emergency
Cc: Peter Borrows; Rob Drury; [redacted]
Subject: Technical Situation Report W39 (2).docx
Attachments: Technical Situation Report W39 (2).docx

Latest situation report for dam releases, Rob Drury is isolated on the road so I am sending on his behalf

Regards

[redacted]
Acting EGM Water Delivery
QLD Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000 Australia
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W39	Date of TSR release	11.1.2011	Time of TSR release	12.00pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Maintain releases to keep Wivenhoe below fuse plug initiation and releases need to be made to ensure the dam security and minimise flood impacts downstream if possible	
Strategy	• Maintain current release of 3970cumecs as long as possible but it may need to be increased • Close sluices at Somerset Dam to store more water however will affect upstream areas. • Current estimate of peak dam level is between EL74.5 and EL74.8 (assuming no further significant rainfall). However it is noted that rainfall is continuing across the catchment. • Further rainfall in the next 3 hours will require releases to be increased in accordance with Strategy W4, page 29 of the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam (Flood Operations Manual)	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 103.30 AHD and rising. Peak inflow to the dam is estimated to be about 4,200 m3/s. Volume stored above FSL is 240,00ML at 163.3%

The dam level peaked at 103.52m AHD at 19:00 on Monday 10 January 2011, (unless further significant rainfall is experienced). Areas around Kilcoy will continue to be adversely affected.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

The dam level is 74.1m AHD and rising at about 25 mm/hour. Holding 930,000ML above FSL and 179.5%.Releases from the dam are currently 3,970cumec/s. Outflows into the Brisbane River from both Lockyer Creek and the Bremer River are also increasing.

At this stage it is considered that without further rainfall the dam can be kept at around 74.8m.

The aim is to prevent fuse plug initiation.

Currently the situation is being assessed every 3 hours.

If further rainfall occurs, dam releases may need to be increased further.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate over the next 24 hours. The flood operation centre will continue to monitor the situation and provide situation reports every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time	PM	or Event	

Litsupport Brisbane

From: Dan Spiller
Sent: Tuesday, 11 January 2011 1:18 PM
To: [redacted]au; Ken Smith
Cc: Barry Dennien; Peter Borrows; Rob Drury [redacted]
Subject: Wivenhoe Dam release update
Attachments: image001.png; Technical Situation Report W39 (2).docx

All,

Attached is the updated Technical Situation Report.

Releases from Wivenhoe Dam have needed to be increased to 3,970 cubic metres per second. BoM is modelling based on this strategy.

Based on these releases, Wivenhoe Dam will peak at between 74.5 and 74.8m with no further inflows.

Further inflows will require further releases. Seqwater is considering worst case scenarios to provide to BoM and BCC to model impacts.

Regards,
Daniel Spiller

Sound Advice

Safe Listening

D465

TECHNICAL SITUATION REPORT

TSR Number	W39	Date of TSR release	11.1.2011	Time of TSR release	12.00pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Maintain releases to keep Wivenhoe below fuse plug initiation and releases need to be made to ensure the dam security and minimise flood impacts downstream if possible	
Strategy	• Maintain current release of 3970cumecs as long as possible but it may need to be increased • Close sluices at Somerset Dam to store more water however will affect upstream areas. • Current estimate of peak dam level is between EL74.5 and EL74.8 (assuming no further significant rainfall). However it is noted that rainfall is continuing across the catchment. • Further rainfall in the next 3 hours will require releases to be increased in accordance with Strategy W4, page 29 of the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam (Flood Operations Manual)	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 103.30 AHD and rising. Peak inflow to the dam is estimated to be about 4,200 m3/s. Volume stored above FSL is 240,00ML at 163.3%

The dam level peaked at 103.52m AHD at 19:00 on Monday 10 January 2011, (unless further significant rainfall is experienced). Areas around Kilcoy will continue to be adversely affected.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

The dam level is 74.1m AHD and rising at about 25 mm/hour. Holding 930,000ML above FSL and 179.5%.Releases from the dam are currently 3,970cumec/s. Outflows into the Brisbane River from both Lockyer Creek and the Bremer River are also increasing.

At this stage it is considered that without further rainfall the dam can be kept at around 74.8m.

The aim is to prevent fuse plug initiation.

Currently the situation is being assessed every 3 hours.

If further rainfall occurs, dam releases may need to be increased further.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate over the next 24 hours. The flood operation centre will continue to monitor the situation and provide situation reports every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	[redacted]

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time	PM	or Event	

TECHNICAL SITUATION REPORT

TSR Number	W38	Date of TSR release	11.1.2011	Time of TSR release	6.30am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Maintain releases to keep Wivenhoe below RL74 at which significant releases need to be made to ensure the dam security and minimise flood impacts downstream if possible	
Strategy	• Maintain current release of 2750cumecs as long as possible but it may need to be increased • Close sluices at Somerset Dam to store more water however will affect upstream areas. •	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Rainfall continues in the North Pine Dam, Somerset Dam and Wivenhoe Dam catchments. Isolated falls in the Upper Brisbane River of up to 125 mm have been recorded with widespread falls of 40 to 70 mm in the Somerset Dam catchment. This rainfall will increase inflows into the dam.

There has also been 20 to 60 mm in the Lockyer Creek catchment in the last 12 hours with falls of up to 30 mm in the Bremer River.

A severe weather warning remains current for heavy rainfall in the dam catchment areas. The QPF issued by BOM at 16:00 estimates rainfalls for the 24 hours to 10:00 Tuesday as North Pine Dam (25mm to 50mm, with isolated falls to 100mm); Wivenhoe/Somerset Dam Catchments (25mm to 50mm, with isolated falls to 100mm).

North Pine Dam (Full Supply Level 39.60 m AHD)

The dam level is 39.80m AHD and has commenced rising again (storing 4,400ML above FSL). Five gates are open releasing 177 m3/s. The inflow into the dam since the commencement of the event is 77,000 ML. Estimated event volume is 88,000 ML assuming no further rainfall. Releases from the dam will continue until at least Wednesday 12 January 2011.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 103.27m AHD and falling slowly. Peak inflow to the dam is estimated to be about

4,200 m3/s. Total discharge into Wivenhoe Dam is currently 1400 m3/s and this discharge will be decreased in the next few hours to be around 500 m3/s later on Tuesday. This is to ensure that the combined flood mitigation capacity in Somerset and Wivenhoe Dam is maximized.

The dam level peaked at 103.52m AHD at 19:00 on Monday 10 January 2011, (unless further significant rainfall is experienced). Areas around Kilcoy will continue to be adversely affected.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

The dam level is 73.51m AHD and rising at about 25 mm/hour. Releases from the dam have been held at a rate of 2,750 m3/s since 19:30 hours on Monday 10 January 2011. Outflows into the Brisbane River from both Lockyer Creek and the Bremer River are also increasing.

The BoM has provided further advice about the flash flooding experienced in the upper areas of Lockyer Creek. The rainfall responsible for this event was not observed at any rain[illegible]tions but it is considered to be extre[illegible] flood levels in the Lock[illegible] exceed [illegible]um recorded levels in some stations in the upper catchment. This flow will resu[illegible]eases in Brisbane River levels below the junction of Lockyer Creek.

Five radial gates are currently open at the dam releasing about 2,750m3/s into the Brisbane River. At this stage, the dam will reach just over 74.0m AHD during Tuesday evening.

Above EL 74.0m AHD the objective for dam operations is to maintain the security of the dam and minimise downstream flood flows if possible.

If further rainfall occurs, dam releases may need to be increased further and this may result in river flows in the lower Brisbane River approaching or exceeding 5,000m3/s.

Impacts downstream of Wivenhoe Dam

The projected Wivenhoe Dam releases combined with Lockyer Creek flows and local runoff will mean that all crossings downstream of Wivenhoe (Twin Bridges, Fernvale, Savages Crossing, Burtons Bridge, Kholo Bridge, Mt Crosby Weir and Colleges Crossing) will be adversely impacted until at least Sunday 16 January in varying degrees.

Water levels in the lower Brisbane River will be impacted by the combined flows of Lockyer Creek, Bremer River, local runoff and releases from Wivenhoe Dam.

The BoM will provide further information regarding the magnitude of the flash flood event occurring in Lockyer Creek early Tuesday morning. Consideration was given to modifying the releases from Wivenhoe Dam to try to moderate the peak flows emanating from Lockyer Creek but the rainfall in the past 12 hours in the catchment above the dam makes this option not possible. Therefore instead of decreasing releases to accommodate the Lockyer Creek flows, the strategy will endeavour to maintain the current releases until Lockyer Creek peaks.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate over the next 24 hours. The flood operation centre will continue to monitor the situation and provide situation reports every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	11.1.2011	**Time**	PM	**or Event**	

[redacted]

From: John Adcock
Sent: Tuesday, 11 January 2011 8:20 AM
To: Dan Spille[redacted]
Subject: FW: Water Grid Update - Dam Releases - 11 January 2011 - NEW FIGURES

Importance: High

Categories: T8

Please see new figures and add part at bottom re: Kilcoy for your review and approval

From: John Adcock
Sent: Tuesday, 11 January 2011 8:12 AM
To: Dan Spiller; [redacted]
Cc: [redacted]
Subject: FW: Water Grid Update - Dam Releases - 11 January 2011
Importance: High

This morning's draft Media Update for your review and approval. Please advise any changes asap

Water Grid update – 11 January 2011

Unprecedented Wivenhoe Dam releases

Significant rainfall received across catchments has caused waterways upstream of Somerset and Wivenhoe Dams to rise quickly overnight.

Wivenhoe Dam is currently at 173% of Full Supply Capacity. Controlled releases through the five gates are being increased to around 315,000 megalitres over today. These These releases are being made in consultation with the Bureau of Meteorology and local councils and aim to limit downstream impacts where possible, noting that these large releases are necessary for the safe management of the dam.

Release levels will be progressively reviewed depending on rainfall across the catchments today.

Local Councils have been advised that as a result of Lockyer Creek flows, local runoff and Wivenhoe releases, Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge Colleges Crossing, Fernvale Bridge, and Mt Crosby Weir Bridge may be inundated until at Sunday 16 January. Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

All recreations areas around Somerset and Wivenhoe are closed, and given the dam levels and the need for safety around spillways, **we will not be able to facilitate any land-based media access to our sites today.**

While substantial amounts of water is being released into Wivenhoe from Somerset Dam, water levels in Somerset are expected to continue to rising today and areas around Kilcoy are likely to be impacted by these rising dam levels.

Five gates are open at North Pine Dam, releasing around 15,000 megalitres a day and will continue until at least Wednesday 12 January. The local Council is being kept informed regarding Youngs Crossing.

Gate releases at Leslie Harrison Dam are underway due to rainfall and inflows.

A minor release of around 1200 megalitres a day is being made through the emergency gates at Hinze Dam. There is no access to the spillway.

For detailed information on road crossing closures and other potential impacts, always contact your local council.

UPPER SOMERSET TOWNSHIPS URGED TO CONSERVE WATER

Residents in the upper Somerset townships of Kilcoy, Jimna and Linville are being urged to conserve water due to the impacts of local flooding on water infrastructure.

Water Grid spokesperson Dan Spiller said vital water infrastructure in these regions has been damaged by flood waters, cutting off the raw water supply.

"We have a limited supply in local reservoirs that is expected to last one to three days. However, we will ensure that critical supplies are maintained. In the meantime we are asking people to conserve water while we repair equipment and organise alternate supplies," he said.

The power is currently down at the main water treatment plant in Kilcoy, with flood water restricting access to rectify the situation.

In Jimna and Linville rising waters have impacted infrastructure that supports the region's supply.

Approximately 1,000 residents on town water across these three areas are impacted.

"We are asking people to restrict non-essential water use, including limiting shower times and considering alternative water supplies where possible," said Mr Spiller.

The Water Grid Manager is working closely with Emergency Management Queensland to gain access to the plants and to rectify all situations. Current demand and supply levels are being closely monitored and alternate water supplies are being considered.

"We are looking at trucking in tankers to fill the reservoirs and are also considering the supply of bottled water if necessary. Obviously we cannot truck in water while roads are closed," said Mr Spiller.

Residents with further supply questions can contact the Water Grid call centre on 1800 771 497.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: Barry Dennien
Sent: Tuesday, 11 January 2011 8:33 AM
To: Dan Spiller
Subject: Re: Levels

Categories: T8

Dan let quu know asap

Regards
Barry Dennien

On 11/01/2011, at 8:28 AM, "Dan Spiller" [redacted]

Based on 3700 cumecs release?

By when?

From: Barry Dennien
Sent: Tuesday, 11 January 2011 8:29 AM
To: Dan Spiller
Subject: Re: Levels

BOM forecast 6000 plus cumecs in river 4 plus meters at port office

74 flood 5.45m

Regards

Barry Dennien

On 11/01/2011, at 8:00 AM, "Dan Spiller" [redacted] wrote:

Wivenhoe Dam: 173%

Somerset Dam: 160%

Daniel Spiller

Director, Operations

SEQ Water Grid Manager

[redacted]

Visit: Level 15, 53 Albert Street Brisbane

Post: PO Box 16205, City East QLD 4002

ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: John Adcock
Sent: Tuesday, 11 January 2011 8:39 AM
Subject: Water Grid Update - Dam Releases - 11 January 2011

Importance: High

Categories: T8

Water Grid update – 11 January 2011

Unprecedented Wivenhoe Dam releases

Significant rainfall received across catchments has caused waterways upstream of Somerset and Wivenhoe Dams to rise quickly overnight.

Wivenhoe Dam is currently at 173% and rising. Somerset Dam is at 160%.

Controlled releases through the five gates have been held at around 236,000 megalitres since early last night but will need to be increased further today. These releases will are being made in consultation with the Bureau of Meteorology and local councils and aim to limit downstream impacts where possible. Note these large releases are necessary for the safe management of the dam.

Release levels will be progressively reviewed depending on rainfall across the catchments today.

Local Councils have been advised that as a result of Lockyer Creek flows, local runoff and Wivenhoe releases, Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge Colleges Crossing, Fernvale Bridge, and Mt Crosby Weir Bridge may be inundated until at Sunday 16 January. Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

All recreations areas around Somerset and Wivenhoe are closed, and given the dam levels and the need for safety around spillways, **we will not be able to facilitate any land-based media access to our sites today.**

While substantial amounts of water is being released into Wivenhoe from Somerset Dam, water levels in Somerset are expected to continue to rising today and areas around Kilcoy are likely to be impacted by these rising dam levels.

Five gates are open at North Pine Dam, releasing around 15,000 megalitres a day and will continue until at least Wednesday 12 January. The local Council is being kept informed regarding Youngs Crossing.

Gate releases at Leslie Harrison Dam are underway due to rainfall and inflows.

A minor release of around 1200 megalitres a day is being made through the emergency gates at Hinze Dam. There is no access to the spillway.

For detailed information on road crossing closures and other potential impacts, always contact your local council.

UPPER SOMERSET TOWNSHIPS URGED TO CONSERVE WATER

Residents in the upper Somerset townships of Kilcoy, Jimna and Linville are being urged to conserve water due to the impacts of local flooding on water infrastructure.

Water Grid spokesperson Dan Spiller said vital water infrastructure in these regions has been damaged by flood waters, cutting off the raw water supply.

"We have a limited supply in local reservoirs that is expected to last one to three days. However, we will ensure that critical supplies are maintained. In the meantime we are asking people to conserve water while we repair equipment and organise alternate supplies," he said.

The power is currently down at the main water treatment plant in Kilcoy, with flood water restricting access to rectify the situation.

In Jimna and Linville rising waters have impacted infrastructure that supports the region's supply.

Approximately 1,000 residents on town water across these three areas are impacted.

"We are asking people to restrict non-essential water use, including limiting shower times and considering alternative water supplies where possible," said Mr Spiller.

The Water Grid Manager is working closely with Emergency Management Queensland to gain access to the plants and to rectify all situations. Current demand and supply levels are being closely monitored and alternate water supplies are being considered.

"We are looking at trucking in tankers to fill the reservoirs and are also considering the supply of bottled water if necessary. Obviously we cannot truck in water while roads are closed," said Mr Spiller.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

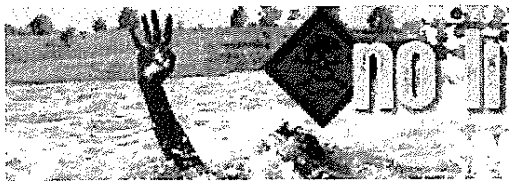
About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



A WATER SAFETY INITIATIVE FROM SEQ Water Grid

Swimming in weirs and f
flowing water is FAT

rethink

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: [redacted]
Sent: Tuesday, 11 January 2011 8:52 AM
To: Dan Spiller; Best Debbie[redacted]
Barry Dennien
Subject: RE: Water Grid dam release strategy

Categories: T8

After speaking to Dan, his offer a face-to-face briefing is not required.
We don't want to impact on operations and are happy to be updated by email or phone.

[redacted]

Policy Advisor
Office of the Minister for Natural Resources,
Mines and Energy and Minister for Trade
[redacted]

From [redacted]
Sent: Tuesday, 11 January 2011 8:32 AM
To: 'Dan Spiller'; 'Best Debbie'; [redacted] Dennien Barry
Subject: RE: Water Grid dam release strategy

Dan Debbie
A briefing would be good at a time appropriate to your setting of the release strategy for the coming hours.
Please confirm if 10am is still your preferred time.
Please also let me know if you require assistance from this end.

[redacted]

Policy Advisor
Office of the Minister for Natural Resources,
Mines and Energy and Minister for Trade
[redacted]

From: Dan Spiller [redacted]
Sent: Tuesday, 11 January 2011 7:17 AM
[redacted]
Cc: Barry Dennien; [redacted]; 'Rob Drury'; [redacted] 'Damien Brown
[redacted]
Subject: Water Grid dam release strategy

All,

Attached is the latest report, with the BoM warning on the Lockyer flood below.

Key points are:

- Current releases are 2,750 cubic metres per second (about 240,000 ML/day). Due to heavy rainfall in the catchment, it was not possible to reduce releases to allow the Lockyer Valley flows to pass.
- Further rainfall may result in the need to increase releases.

- Wivenhoe Dam is at 73.51m AHD and rising at about 25mm/hour. Above 74m, the primary objective becomes maintaining the security of the dam. Releases would be increased at this level with less scope for consideration of downstream impacts.

The BoM is remodeling based on this release strategy. There is some uncertainty about the level of flows coming from the Lockyer.

Please call me on [redacted] if you require any further information.

Debbie and Tim: I recommend that a briefing for the Minister would be appropriate, perhaps around 10am.

Regards,
Daniel Spiller

Australian Government Bureau of Meteorology Queensland

PRIORITY
FLOOD WARNING FOR THE LOCKYER, BREMER, WARRILL AND BRISBANE RIVER BELOW WIVENHOE INCLUDING BRISBANE CITY Issued at 4:06 AM on Tuesday the 11th of January 2011 by the Bureau of Meteorology, Brisbane.

The main flood waters in the Lockyer Creek are now arriving at Lyons Bridge, with strong stream rises expected during Tuesday.

Wivenhoe dam is providing significant mitigation of upper Brisbane floods. River flows from the Bremer and Lockyer catchments combined with releases from Wivenhoe dam are expected to increase levels in Brisbane during Tuesday.

At the Brisbane City Gauge, minor flood levels of about 2.1 metres are expected with the afternoon high tide on Tuesday and levels of about 3 metres are expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

LOCKYER CREEK:
Extremely heavy rainfall during Monday led to extreme rises in the Lockyer Creek catchment and Laidley Creek at Mulgowie. Record flood levels of 18.92 metres were recorded at Gatton Monday evening before the station failed. This level was well above the previous record peak of 16.33 metres from the February 1893 flood.

The main flood waters are currently arriving at Lyons Bridge, with strong stream rises expected in the next few hours. The Lockyer Creek at Glenore Grove peaked at 14.60 metres at 11:30pm, which is 0.3 metres below the 1974 flood.

Renewed stream rises have commenced in Lockyer Creek at Lyons Bridge with a peak between 16 and 16.5 metres expected Tuesday morning. This is likely to be similar in level to the 1996 flood.

BREMER RIVER:
The Bremer River at Walloon has exceeded the moderate flood level. The Bremer River at Rosewood peaked at 5.8 metres around midnight monday.

The Bremer River at Ipswich is expected to reach about 12.7 metres on Tuesday afternoon. Higher levels are possible.

WARRILL CREEK

Warrill Creek at Amberley peaked at 5.98 metres around 9pm Monday.

MIDDLE AND LOWER BRISBANE:
Moderate flooding is developing at Savages Crossing and at Mt Crosby Weir.

At the Brisbane City Gauge (lower end of Edward Street and at Thornton Street), minor flood levels of about 2.1 metres are expected with the afternoon high tide on Tuesday and levels of about 3 metres are expected with the high tides on Wednesday causing moderate flooding.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Predicted River Heights/Flows:
Ipswich: Reach about 12.7 metres (major) during Tuesday afternoon.

Moggill: Reach about 12 metres (minor) during Tuesday afternoon.

Jindalee: Reach about 7 metres (minor) overnight Tuesday.

Brisbane: Reach about 2.1 metres (minor) with the afternoon high tide on Tuesday. Reach about 3 metres (moderate) with the high tides on Wednesday.

(3 metres at the Brisbane City gauge is about 1.5 metres higher than the highest tide of the year at this location).

Further rises are possible at all four locations depending on further rain.

Next Issue:
The next warning will be issued at about 8am Tuesday.

Latest River Heights:

Lockyer Ck at Helidon #	12.68m steady	03:02 PM MON 10/01/11
Flagstone Ck at Brown-Zirbels Rd *	3.49m falling	02:10 AM TUE 11/01/11
Sandy Creek at Sandy Creek Road #	2.15m falling	03:19 AM TUE 11/01/11
Ma Ma Ck at Harm's *	3.26m rising	02:30 AM TUE 11/01/11
Tenthill Ck at Tenthill *	5.57m rising	02:40 AM TUE 11/01/11
Lockyer Ck at Gatton #	18.92m rising	06:30 PM MON 10/01/11
Laidley Ck at Mulgowie *	6.39m rising	02:20 AM TUE 11/01/11
Laidley Ck at Laidley	8.7m falling slowly	10:00 PM MON 10/01/11
Laidley Ck at Showground Weir #	7.84m rising	03:25 AM TUE 11/01/11
Laidley Ck at Warrego Hwy *	6.41m rising	02:00 AM TUE 11/01/11
Lockyer Ck at Glenore Grove #	13.8m falling	03:24 AM TUE 11/01/11
Lockyer Ck at Lyons Br #	15.55m rising	03:23 AM TUE 11/01/11
Lockyer Ck at Rifle Range Rd *	15.39m rising	02:40 AM TUE 11/01/11
Lockyer Ck at O'Reilly's Weir #	18m falling	03:28 AM TUE 11/01/11
Brisbane R at Lowood Pump Stn #	15.93m falling	03:31 AM TUE 11/01/11
Brisbane R at Savages Crossing #	15.89m rising	03:29 AM TUE 11/01/11
Brisbane R at Burtons Br #	12.22m rising	03:29 AM TUE 11/01/11
Brisbane R at Kholo Br #	7.99m rising	03:29 AM TUE 11/01/11
Brisbane R at Mt Crosby #	15.82m steady	03:30 AM TUE 11/01/11
Brisbane R at Mt Crosby #	14.08m falling	04:39 PM MON 10/01/11
Brisbane R at Colleges Crossing #	13.91m rising	03:32 AM TUE 11/01/11
Bremer R at Rosewood#	5.56m falling	03:11 AM TUE 11/01/11
Bremer R at Five Mile Br Walloon #	6.4m rising	03:15 AM TUE 11/01/11
Warrill Ck at Greens Rd Amberley #	5.84m falling	03:29 AM TUE 11/01/11
Bremer R at One Mile Br #	13.75m rising	03:31 AM TUE 11/01/11
Bremer R at Hancocks Br Brassall #	11.33m rising	03:22 AM TUE 11/01/11
Bremer R at Ipswich #	8.55m rising	03:31 AM TUE 11/01/11
Brisbane R at Moggill #	7.07m rising	03:29 AM TUE 11/01/11

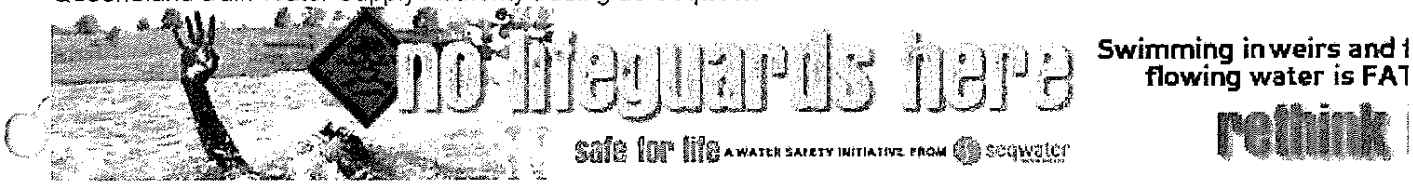
Brisbane R at Jindalee Br #	4.5m rising	03:29 AM TUE 11/01/11
Brisbane R at City Gauge #	1.4m falling	03:15 AM TUE 11/01/11

*automatic station

Warnings and River Height Bulletins are available at http://www.bom.gov.au/qld/flood/ .
Flood Warnings are also available on telephone 1300 659 219 at a low call cost of 27.5 cents, more from mobile, public and satellite phones.

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and /or publication of this email is also prohibited.

Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.

Please consider the environment before printing this email.

[redacted]

From: Dan Spiller
Sent: Tuesday, 11 January 2011 9:06 AM
To: Barry Dennien
Subject: RE: Levels

Categories: T8

Just have.

Colin is sending 5000 cumecs indunation maps and street list now. Starting work on 6000 cumecs impacts.

Seqwater is closing out this strategy. They will then start work on worse case scenarios for this afternoon (ie dam fills to above 75m AHD and all flows need to be passed through). We will provide this to BoM to model river levels and then to Brisbane to model inundation impacts.

QUU advised and planning.

Linkwater advised and planning.

Dan

From: Barry Dennien
Sent: Tuesday, 11 January 2011 9:00 AM
To: Dan Spiller
Subject: Re: Levels

Did you get him

Regards
Barry Dennien

On 11/01/2011, at 8:51 AM, "Dan Spiller" [redacted] wrote:

> Left msg. Sent email. Ringing again.

> **From:** Barry Dennien
> **Sent:** Tuesday, 11 January 2011 8:52 AM
> **To:** Dan Spiller
> **Subject:** Re: Levels
>
> Dan
>
> Have you rung col Jensen premier has asked
>
> Regards
>
> Barry Dennien

On 11/01/2011, at 8:28 AM, "Dan Spiller" [redacted] wrote:

Based on 3700 cumecs release?

By when?

From: Barry Dennien
Sent: Tuesday, 11 January 2011 8:29 AM
To: Dan Spiller
Subject: Re: Levels

BOM forecast 6000 plus cumecs in river 4 plus meters at port office

74 flood 5.45m

Regards

Barry Dennien

On 11/01/2011, at 8:00 AM, "Dan Spiller" [redacted] wrote:

Wivenhoe Dam: 173%

Somerset Dam: 160%

Daniel Spiller

Director, Operations

SEQ Water Grid Manager

[redacted]

Visit: Level 15, 53 Albert Street Brisbane

Post: PO Box 16205, City East QLD 4002

ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: Colin Jensen [redacted]
Sent: Tuesday, 11 January 2011 9:27 AM
To: Barry Dennien; Dan Spiller; [redacted]
Cc: Chris Lavin; [redacted]
Subject: BCC Innundation Maps for 5000m3/s
Attachments: 5000 m3 Brisbane East.pdf; 5000 m3 Brisbane South.pdf; 5000 m3 Brisbane West.pdf; 5000 m3 Whole of Brisbane.pdf

Categories: T8

+=*
Place: LDCC
+=*
Gentlemen

Please find attached our flood maps for river flows of 5,000 cumecs FYI. I will also provide a list of suburbs and streets when I have it to hand.

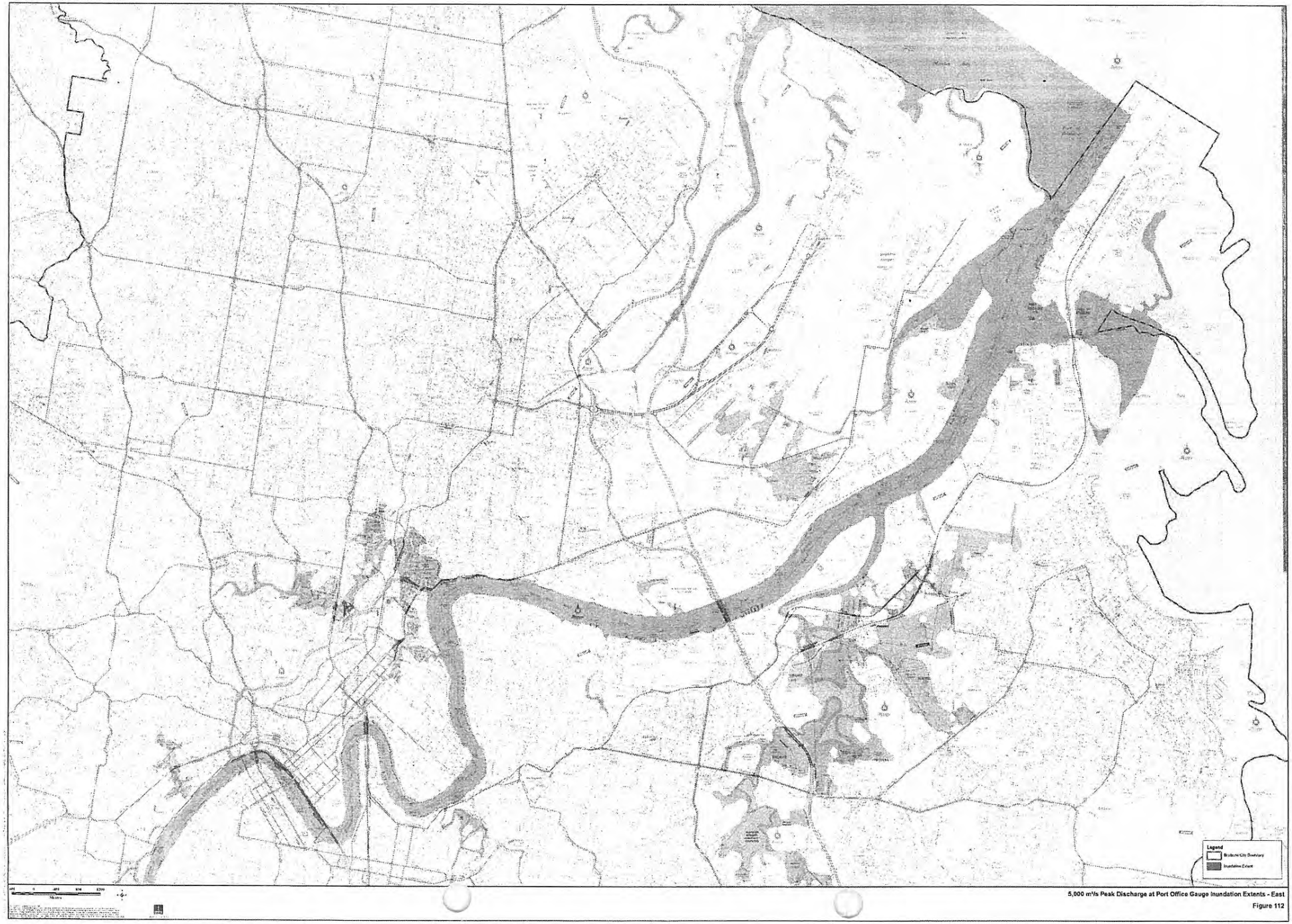
I note the preliminary advice from BOM is to start our consideration of a 6,000 cumec event for Thursday

Regards

Colin Jensen
Chief Executive Officer
Brisbane City Council
GPO Box 1434 | Brisbane Qld 4001
Level 23, Brisbane Square | 266 George Street, Brisbane, Qld 4000

[redacted]

This message has passed through an insecure network.
Please direct all enquiries to the message author.



5,000 m³/s Peak Discharge at Port Office Gauge Inundation Extents - East

Figure 112



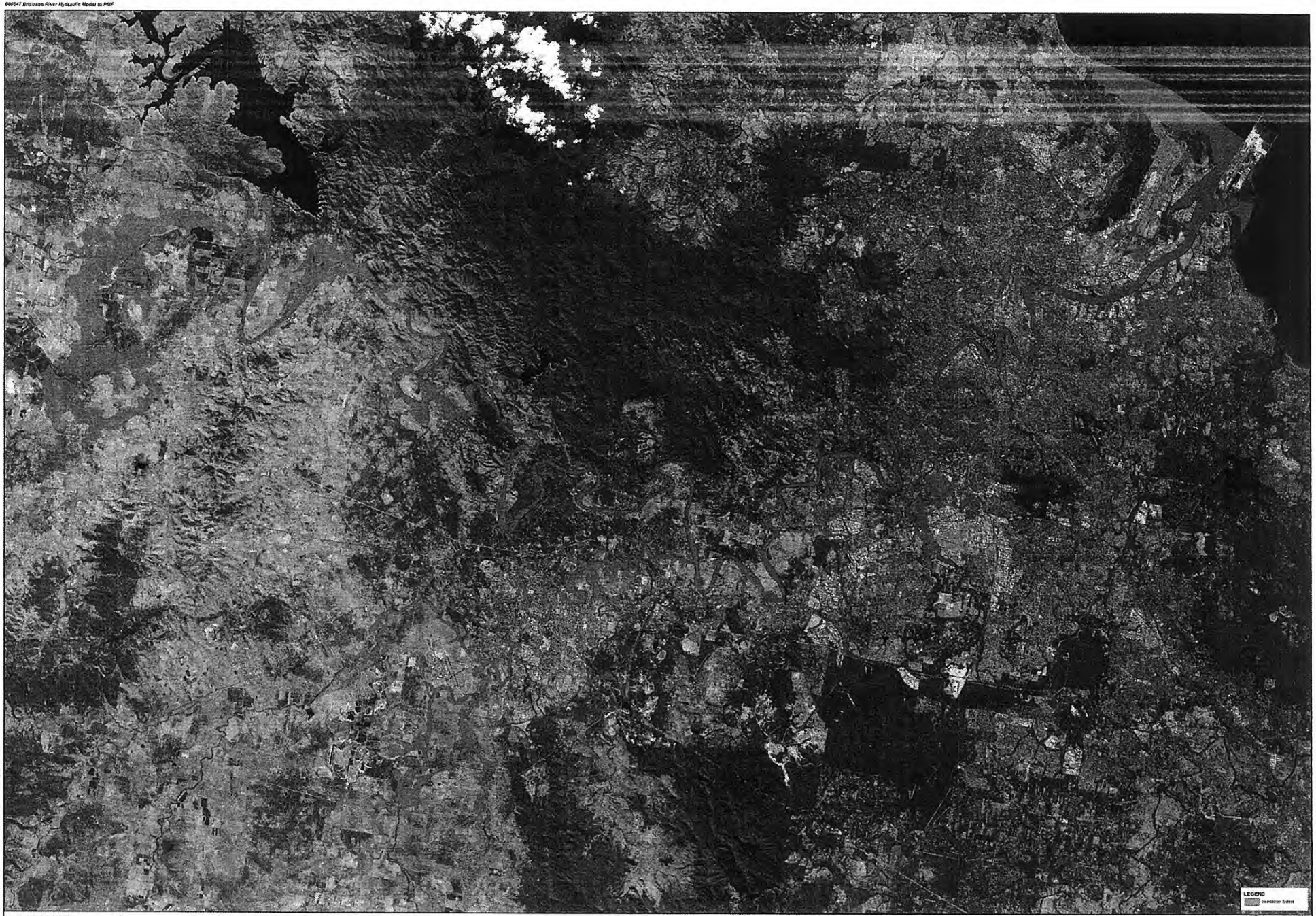
5,000 m³/s Peak Discharge at Port Office Gauge Inundation Extents - South

Figure 111



5,000 m³/s Peak Discharge at Port Office Gauge Inundation Extents - West

Figure 110



5,000 m³/s Peak Discharge at Port Office Gauge Inundation Extents
Figure 109

[redacted]

From: SEQWGM Media
Sent: Tuesday, 11 January 2011 11:39 AM
Subject: MEDIA ALERT: RESIDENTS URGED TO CONSERVE WATER SUPPLY

Importance: High

Categories: T8

MEDIA ALERT
11 JANUARY 2011

RESIDENTS URGED TO CONSERVE WATER SUPPLY

All Somerset, Scenic Rim and Lockyer Valley residents are being urged to conserve water due to the impacts of local flooding on water infrastructure.

Water Grid spokesperson Dan Spiller said vital water infrastructure in these regions has been damaged by flood waters, cutting off the raw water supply.

"Although we have a limited supply in the local reservoirs, we are unable to get tankers in to replenish this supply due to flooded roads. We are also facing issues with loss of power at some water treatment plants.

"We are therefore urging residents to restrict all non-essential use until further notice.

The Water Grid Manager, Queensland Urban Utilities and Emergency Management Queensland are working closely to gain access to the plants and to rectify all situations.

"We are working urgently to find ways for tankers to get in and replenish supplies. We are also considering options for getting bottled water in to those areas," said Mr Spiller.

Residents with further enquiries can contact the local water retailer, Queensland Urban Utilities on 13 26 57, or for emergencies please call 13 23 64.

ENDS

For further details contact the Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

SEQ Water Grid Communications Unit

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.



[redacted]

From: Dan Spiller
Sent: Tuesday, 11 January 2011 5:09 PM
To: [redacted]
Subject: How about 5.30 here?

Categories: T8

[redacted]

From: [redacted] on behalf of Corporate Communications [redacted]

Sent: Tuesday, 11 January 2011 1:02 PM

To: SEQWGM Media; Reception; [redacted] Barry Dennien; Dan Spiller; [redacted]

Cc: [redacted]

Subject: Release Update

Categories: T8

As at 1.00 pm on Tuesday 11 January, the following applies:

SOMERSET DAM:
Releases have stopped, however levels in Somerset are expected to continue rising and areas around Kilcoy are likely to be impacted.

WIVENHOE DAM:
Releases through five gates have been increased to 344,000 megalitres as at 1.00pm and may need to be increased to around 516,000 megalitres a day by Wednesday 12 January due to rainfall in the Stanley and Upper Brisbane.

Local Councils have been advised that as a result of Lockyer Creek flows, local runoff and Wivenhoe releases, Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge Colleges Crossing, Fernvale Bridge, and Mt Crosby Weir Bridge may be inundated until at least Sunday 16 January.

NORTH PINE DAM:
Five gates are open, and will continue until at least Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

LESLIE HARRISON DAM:
Gate releases are underway due to rainfall and inflows.

HINZE DAM:
A minor release of around 4,300 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

For detailed information on river levels, road and crossing closures and other potential impacts, always contact your local council.

RECREATION UPDATE:
Both Wivenhoe and Somerset are closed to all recreational activities.

The following recreation sites are closed –

- O'Sheas Crossing
- Hamon Cove
- Logan Inlet
- Captain Logan Camp
- Lumley Hill

- Spillway Common/ Atkinson's Crossing
- Cormorant Bay
- Branch Creek
- Billies Bay/Hays Landing
- The Spit
- Lake Somerset Holiday Park Kirkleagh
- Somerset Park Camping area

This information will be updated during Tuesday 11 January.

[redacted]
Senior Communications Advisor
Queensland Bulk Water Supply Authority *trading as* Seqwater



Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: [redacted]
Sent: Tuesday, 11 January 2011 1:18 PM
To: [redacted] Ken Smith [redacted] Debbie Best [redacted]
Cc: Barry Dennien; Peter Borrows; Rob Drury ([redacted])
Subject: Wivenhoe Dam release update
Attachments: image001.png; Technical Situation Report W39 (2).docx

Categories: T8

All,

Attached is the updated Technical Situation Report.

Releases from Wivenhoe Dam have needed to be increased to 3,970 cubic metres per second. BoM is modelling based on this strategy.

Based on these releases, Wivenhoe Dam will peak at between 74.5 and 74.8m with no further inflows.

Further inflows will require further releases. Seqwater is considering worst case scenarios to provide to BoM and BCC to model impacts.

Regards,
Daniel Spiller

TECHNICAL SITUATION REPORT

TSR Number	W39	Date of TSR release	11.1.2011	Time of TSR release	12.00pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Maintain releases to keep Wivenhoe below fuse plug initiation and releases need to be made to ensure the dam security and minimise flood impacts downstream if possible	
Strategy	• Maintain current release of 3970cumecs as long as possible but it may need to be increased • Close sluices at Somerset Dam to store more water however will affect upstream areas. • Current estimate of peak dam level is between EL74.5 and EL74.8 (assuming no further significant rainfall). However it is noted that rainfall is continuing across the catchment. • Further rainfall in the next 3 hours will require releases to be increased in accordance with Strategy W4, page 29 of the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam (Flood Operations Manual)	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset Dam (Full Supply Level 99.00 m AHD)

The dam level is 103.30 AHD and rising. Peak inflow to the dam is estimated to be about 4,200 m3/s. Volume stored above FSL is 240,00ML at 163.3%

The dam level peaked at 103.52m AHD at 19:00 on Monday 10 January 2011, (unless further significant rainfall is experienced). Areas around Kilcoy will continue to be adversely affected.

Wivenhoe Dam (Full Supply Level 67.00 m AHD)

The dam level is 74.1m AHD and rising at about 25 mm/hour. Holding 930,000ML above FSL and 179.5%.Releases from the dam are currently 3,970cumec/s. Outflows into the Brisbane River from both Lockyer Creek and the Bremer River are also increasing.

At this stage it is considered that without further rainfall the dam can be kept at around 74.8m.

The aim is to prevent fuse plug initiation.

Currently the situation is being assessed every 3 hours.

If further rainfall occurs, dam releases may need to be increased further.

Outlook

Heavy rainfall continues throughout South East Queensland and the situation could deteriorate over the next 24 hours. The flood operation centre will continue to monitor the situation and provide situation reports every six hours until the situation stabilizes.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundatian areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	11.1.2011	**Time**	PM	**or Event**		

[redacted]

From: SEQWGM Media
Sent: Tuesday, 11 January 2011 3:26 PM
To: [redacted]
Cc: SEQWGM Communications Staff; Dan Spiller; Barry Dennien; [redacted]
Subject: RE: media alert
Attachments: MEDIA ALERT_Residents urged to conserve water supply.doc

Importance: High

Categories: T8

[redacted]

The attached version is approved from our end.

Thanks

[redacted]

[redacted]
enior Media Advisor
SEQ Water Grid Communications Unit
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

-----Original Message-----
From: [redacted]
Sent: Tuesday, 11 January 2011 2:56 PM
To: SEQWGM Media; [redacted]
Subject: RE: media alert

Hi, please find attached en edited version of the MR that has been ticked off by all in the Min's office. Can you please bounce it off your experts asap and provide a clean copy that can go to the GMU, thanks [redacted]

-----Original Message-[redacted]
From: SEQWGM Media
Sent: Tuesday, 11 January 2011 2:20 PM
To: [redacted]
Cc: SEQWGM Communications Staff
Subject: RE: media alert
Importance: High

[redacted]

Please see draft release attached. We are still waiting on final sign off from DREs. In the meantime, are you happy with this version?

[redacted]
Senior Media Advisor
SEQ Water Grid Communications Unit
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

-----Original Message-----
From: [redacted]
Sent: Tuesday, 11 January 2011 1:27 PM
To: [redacted] SEQWGM Media
Subject:

Hi, Any advance on the water conservation MR? G.

[redacted]
Senior Media Advisor
Office of the Hon Stephen Robertson MP
Minister for Natural Resources, Mines and Energy and Trade
[redacted]

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and /or publication of this email is also prohibited.

Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.

Please consider the environment before printing this email.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination.

Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and /or publication of this email is also prohibited.

Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.

Please consider the environment before printing this email.

Water Grid

Media Release

MEDIA ALERT
11 JANUARY 2011

SEQ RESIDENTS ENCOURAGED TO LIMIT HOUSEHOLD WATER USE TO HELP FLOOD RESPONSE

South East Queensland residents have been encouraged to limit the amount of water they use in coming days until the impact of flooding on water infrastructure can be fully assessed.

Water remains safe to drink and major water treatment plants are not expected to be impacted by flooding.

Most major drinking water reservoirs are at 75 per cent capacity or higher.

Water Grid spokesperson Dan Spiller said the suggestion to conserve water is a precaution until a full assessment can be made of expected damage to smaller treatment plants and reservoirs, mostly in outlying areas of the SEQ region.

"There is a limited supply of water in some local reservoirs and we are unable to get tankers in to replenish supplies due to flooded roads. We are also facing issues with loss of power at some smaller water treatment plants and are experiencing constraints on our ability to supply essential treatment chemicals to plants.

"We are therefore encouraging all SEQ residents to assist in the flood response by restricting non-essential water use until further notice."

The Water Grid, local retailers and Emergency Management Queensland are working closely to gain access to the impacted plants and to rectify all situations to maintain essential supplies.

"We are working urgently to find ways for tankers to get in and replenish supplies. We are also considering options for getting bottled water in to those areas," said Mr Spiller.

Residents with further enquiries can contact their local water retailer with further questions:

Unitywater– 07 5431 8333
Queensland Urban Utilities - 13 26 57
Allconnex – 1300 000 928

For general emergencies please call 13 23 64.

ENDS

Notes to the editor

About the Water Grid

Established in June 2008 in response to the crippling Millennium Drought, the Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information visit www.watergrid.com.au

For further details contact the Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Litsupport Brisbane

From: [redacted]
Sent: Tuesday, 11 January 2011 3:58 PM
To: SEQWGM Emergency
Cc: Dan Spiller; Peter Borrows; [redacted] Rob Drury; [redacted]
Subject: Technical Situation Report W40.docx
Attachments: Technical Situation Report W40.docx

Latest update on releases from Wivenhoe

Regards

[redacted]
Acting EGM Water Delivery
QLD Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000 Australia
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W40	Date of TSR release	11.1.2011	Time of TSR release	4.00pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Maintain releases to keep Wivenhoe below fuse plug initiation and releases need to be made to ensure the dam security and minimise flood impacts downstream if possible	
Strategy	• Inflows into Wivenhoe in excess of 12000 cumecs. • Maintain current release 5700 cumecs as long as possible but due to the high level in the dam may change frequently due to inflows, this is being reviewed every 30 minutes and releases adjusted accordingly. • Close sluices at Somerset Dam to store more water however will affect upstream areas.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected around 1,500,000ML which is close to 1974 event.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset/Wivenhoe Dam

Our strategy revolves ensuring dam security and is around trying to prevent initiation of the first fuse plug at EL 75.6m. If this happens we will get a rapid increase of about 2,000m3/s in outflow from the dam in addition to the gate release which could be as high as 10,000m3/s at the time. Sluices have been closed at Somerset and this will result in high upstream water levels affecting Kilcoy.

Wivenhoe Dam is rising very quickly and rapid gate openings are required to manage this increase. Based on the current rate of rise, inflow rate is in excess of 12,000m3/s. The situation is being revised constantly and releases will be increased hourly until the water level starts to stabilize. It is possible that the releases will be as high as 10,000m3/s in the next few hours. Heavy rainfall continues in the catchment especially around the dam.

It should be noted that the flow in the lower Brisbane R in 1974 was about 9,500m3/s.

Travel time to Lower Brisbane River is 24 hours.

North Pine

Inflows and outflows are at record levels and increasing within inflows nearing 3,000m3/s, and is approaching an extreme event (possibly as high as 1 in 10,000 AEP)

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	11.1.2011	**Time**	PM	**or Event**		

[redacted]

From: [redacted]
Sent: Tuesday, 11 January 2011 4:34 PM
To: Barry Dennien; Dan Spiller
Cc: [redacted]
Subject: FW: Seqwater Storage Capacities Update at 16:00hrs on Tuesday 11 Jan 2011

Categories: T8

Barry, these are the latest figures we have

Please advise if not suitable and I'll have to request them from the Flood Centre

[redacted]

Please refer to table for 16:00hrs update.

seqwater

Dam Capacities on 11 January 2011

Dam	FSL		11/01/2011 12:00		11/01/2011 16:00		
	Level	Actual	Level	Capacity	Level	Capacity	
	m AHD	ML	m AHD	ML	m AHD	ML	%
Atkinson Dam	65.72	30,488	65.77	30,665	65.76	**30,665**	100.6%
Baroon Pocket Dam	217.00	61,000	219.18	68,155	219.62	**73,100**	119.8%
Bill Gunn Dam	110.00	6,947	110.44	7,317	110.61	**7,674**	110.5%
Borumba Dam	135.01	45,952	136.84	55,276	136.35	**52,699**	114.7%
Bromelton Dam	44.50	8,210	44.31	8,021	44.32	**8,031**	97.8%
Cedar Pocket Dam	101.07	730	101.41	814	101.38	**798**	109.4%
Cooloolabin Dam	296.00	13,820	296.30	14,233	296.40	**14,723**	106.5%
Enoggera Dam	74.37	4,567	76.84	5,539	77.81	**6,631**	145.2%
Ewen Maddock Dam	25.38	16,587	26.54	20,838	26.58	**21,760**	131.2%
Gold Creek Dam	92.75	801	96.37	1,452	96.29	**1,522**	190.1%
Hinze Dam	82.20	161,073	84.11	180,537	84.11	**180,537**	112.1%
ake Clarendon Dam	96.00	24,276	93.62	16,842	93.62	**16,842**	69.4%
Lake Kurwongbah (Sideling Creek Dam)	20.42	14,370	21.02	15,361	21.34	**18,055**	125.6%
Lake MacDonald Dam	95.32	8,018	95.58	8,718	95.57	**8,690**	108.4%
Lake Manchester Dam	50.90	26,217	52.61	28,871	53.13	**32,761**	125.0%
Leslie Harrison Dam	18.32	24,868	18.11	24,062	18.13	**24,028**	96.6%
Little Nerang Dam	168.02	6,705	168.88	7,080	168.76	**7,035**	104.9%
Maroon Dam	207.14	44,319	208.76	48,036	209.37	**52,145**	117.7%
Moogerah Dam	154.91	83,765	156.84	97,445	157.34	**105,114**	125.5%
Nindooinbah Dam	122.80	322					
North Pine Dam	39.60	214,302	40.91	225,607	41.01	**246,526**	115.0%
Poona Dam	152.70	655	152.91	673	152.84	**680**	103.8%
Somerset Dam	**99.00**	**379,849**	**103.68**	**610,740**	**104.31**	**665,076**	**175.1%**
Wappa Dam	44.81	4,694	48.37	7,631	48.37	**7,631**	162.6%
Wivenhoe Dam	**67.00**	**1,165,238**	**74.27**	**2,046,825**	**74.81**	**2,201,636**	**188.9%**
Splityard Creek Dam			162.55	25,180	159.95	22,256	
Adjusted Wivenhoe Dam	**67.00**	**1,165,238**		**2,049,705**		**2,201,592**	**188.9%**
Total - North Pine, Somerset & Wivenhoe		**1,759,389**		**2,886,052**		**3,113,194**	**176.9%**
Total - All		**2,347,773**		**3,533,615**		**3,784,314**	**161.2%**

Level 3, 240 Margaret Street
PO Box 16146, City East Qld 4002
[redacted]

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: SEQWGM Media
Sent: Tuesday, 11 January 2011 5:19 PM
Subject: Water Grid Update - Dam Releases - 11 January 2011

Importance: High

Categories: T8

Water Grid update – 11 January 2011

Increased controlled releases from Wivenhoe Dam

NOTE: All SEQ dams are safe, stable and operating within their design specifications.

Wivenhoe Dam is currently at 190 per cent and rising. Somerset Dam is at 176 per cent and also rising.

Controlled releases through Wivenhoe's five radial gates have now been increased to around 490,000 megalitres per day. This is expected to increase. Releases are being made in consultation with the Bureau of Meteorology and local councils and an effort to limit downstream impacts where possible. Note these large releases are necessary for the safe management of the dam.

Due to a combination of Lockyer Creek, local runoff and Wivenhoe releases, Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge Colleges Crossing, Fernvale Bridge, and Mt Crosby Weir Bridge may be inundated until at least Sunday 16 January. Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

All recreations areas around Somerset and Wivenhoe are closed, and given the dam levels and the need for safety around spillways, **we will not be able to facilitate any land-based media access to our sites today.**

While substantial amounts of water is being released into Wivenhoe from Somerset Dam, water levels in Somerset are expected to continue to rising today and areas around Kilcoy are likely to be impacted by these rising dam levels.

Five gates are open at North Pine Dam, releasing around 15,000 megalitres a day and will continue until at least Wednesday 12 January. The local Council is being kept informed regarding Youngs Crossing.

Gate releases at Leslie Harrison Dam are underway due to rainfall and inflows.

Water has spilled from Wyaralong Dam after it exceeded 100 per cent capacity this morning.

A minor release of around 6,600 megalitres a day is being made through the emergency gates at Hinze Dam, which is likely to increase to around 8,000 megalitres per day by 6.00 pm Tuesday 11 January .

For detailed information on road crossing closures and other potential impacts, always contact your local council.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils.**

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au



This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

[redacted]

From: [redacted]
Sent: Tuesday, 11 January 2011 6:19 PM
To: [redacted] Barry Dennien; Dan Spiller; [redacted]
Cc: [redacted]; ELT
Subject: Release Update

Categories: T8

As at 6.00 pm on Tuesday 11 January, the following applies:

SOMERSET DAM:
Releases have stopped, however levels in Somerset are expected to continue rising and areas around Kilcoy are likely to be impacted.

WIVENHOE DAM:
Wivenhoe Dam is rising slowly and releasing about 576,000 megalitres per day.

The current expectation is that the dam will reach a steady state (outflow equals inflow) within the next 3 hours without further significant rainfall.

At this time, release from the dam will be about, 688,000 megalitres.

If there is no further rainfall, it may be possible to then slowly reduce this release overnight.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes.

The Centre is also maintaining close contact with warning agencies and local councils.

NORTH PINE DAM:
Five gates are open, and will continue until at least Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

LESLIE HARRISON DAM:
Gate releases are underway due to rainfall and inflows.

HINZE DAM:
A minor release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

For detailed information on river levels, road and crossing closures and other potential impacts, always contact your local council.

This information will be updated during the evening of Tuesday 11 January.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received

this email in error please contact the sender immediately and delete the material from your email system.
QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Litsupport Brisbane

From: [redacted]
Sent: Tuesday, 11 January 2011 6:28 PM
To: Rob Drury; Dan Spiller; [redacted]; Peter Borrows; [redacted]
Cc: [redacted]
Subject: RE: Technical Report
Attachments: Technical Situation Report W41.docx

Attached is the latest Technical Report.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W41	Date of TSR release	11.1.2011	Time of TSR release	6pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Maintain releases to keep Wivenhoe below fuse plug initiation and releases need to be made to ensure the dam security and minimise flood impacts downstream if possible	
Strategy	• Peak inflows into Wivenhoe in excess of 12000 cumecs. • Increase releases to maintain fuse plug and dam integrity. • Close sluices at Somerset Dam to store more water however will affect upstream areas.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 1,500,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset/Wivenhoe

Our strategy revolves ensuring dam security and is around trying to prevent initiation of the first fuse plug at EL 75.6m. If this happens we will get a rapid increase of about 2,000m3/s in outflow from the dam in addition to the gate release which could be as high as 10,000m3/s at the time.

Sluices have been closed at Somerset and this will result in high upstream water levels affecting Kilcoy. Somerset is at 104.41m holding 671,000ML and 176.6%.

In the last twelve hours totals of up to 370mm have fallen in the area around Wivenhoe Dam. In the last hour, rainfalls between 15 and 30mm have been recorded in the same area. At 1600, the BoM advised that falls between 50 to 100mm are still forecast for the 24hrs to 1600 Wednesday 12 January 2011 for the North Pine and Somerset/Wivenhoe catchments. Current inflows are about 9,000cumecs.

At 1730 Wivenhoe Dam was 74.92m AHD holding 2,200,000ML and 190% and rising slowly and releasing about 6,700m3/s.

The current expectation is that the dam will reach a steady state (outflow equals inflow) within the next 3 hours without further significant rainfall. At this time, release from the dam will be about 8,000 m3/s.

If there is no further rainfall, it may be possible to then slowly reduce this release overnight.

The dam is expected to peak below 75.5m AHD which is 100mmm below the first fuse plug initiation level.

Note that the automatic recorder as indicated on the BoM website is affected by drawdown and is not reflecting the actual lake level and tendency.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is also maintaining close contact with warning agencies and local councils.

It should be noted that the flow in the lower Brisbane R in 1974 was about 9,500m3/s

North Pine Dam:
Five gates are open, and will continue until at least Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 86cumecs or 7396 megalitres a day is being made through the emergency gates and this will increase to around 8,000 megalitres per day by 6.pm Tuesday 11 January There is no public access to the spillway.

Wyralong Dam

As at 5:00pm today 9,680ML/day was passing over the spillway at Wyaralong Dam. This represents a water depth of 0.59m over the spillway. The water level is continuing to rise. Wyaralong Dam Alliance will continue to monitor and advise of water levels and flows.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and ather updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current status.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time	PM	or Event		

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Tuesday, 11 January 2011 7:29 PM
To: Rob Drury; Dan Spiller; [redacted]; Peter Borrows;
Cc: [redacted]
Subject: RE: Technical Report
Attachments: Technical Situation Report W42.docx

Attached is the latest Technical Report.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater





[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W42	Date of TSR release	11.1.2011	Time of TSR release	7pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Maintain releases to keep Wivenhoe below fuse plug initiation and releases need to be made to ensure the dam security and minimise flood impacts downstream if possible	
Strategy	• Peak inflows into Wivenhoe in excess of 12000 cumecs. • Increase releases to maintain fuse plug and dam integrity. • Close sluices at Somerset Dam to store more water however will affect upstream areas.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 1,500,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset/Wivenhoe

Our strategy revolves ensuring dam security and is around trying to prevent initiation of the first fuse plug at EL 75.6m. If this happens we will get a rapid increase of about 2,000m3/s in outflow from the dam in addition to the gate release which could be as high as 10,000m3/s at the time.

Sluices have been closed at Somerset and this will result in high upstream water levels affecting Kilcoy. Somerset is at 104.6m holding 684,000ML and 180.0%.

Somerset should peak at around 105.2m (1974 peak level was 106.5m).

At 1900 Wivenhoe Dam was 74.97m AHD holding 2,227,000ML and 191.1% and rising slowly and releasing about 7,500m3/s.

Since the last update, there has only been an increase in release to 7,500cumecs. At this stage there is no planned increase in releases unless there are further inflows.

If there is no further rainfall, it may be possible to then slowly reduce this release overnight.

The dam is expected to peak below 75.5m AHD which is 100mmm below the first fuse plug initiation level.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is also maintaining close contact with warning agencies and local councils.

It should be noted that the flow in the lower Brisbane R in 1974 was about 9,500m3/s

North Pine Dam:
Five gates are open and continuing to drop. Releases may still continue until Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Wyralong Dam

As at 5:00pm today 9,680ML/day was passing over the spillway at Wyaralong Dam. This represents a water depth of 0.59m over the spillway. The water level is continuing to rise. Wyaralong Dam Alliance will continue to monitor and advise of water levels and flows.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin

BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time	PM	or Event	

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Tuesday, 11 January 2011 8:20 PM
To: Rob Drury; Dan Spiller; [redacted] Peter Borrows;
Cc: [redacted]
Subject: RE: Technical Report
Attachments: Technical Situation Report W43.docx

Attached report W43.

Levels at Wivenhoe now seem to be steady.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W43	Date of TSR release	11.1.2011	Time of TSR release	8pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Maintain releases to keep Wivenhoe below fuse plug initiation and releases need to be made to ensure the dam security and minimise flood impacts downstream if possible	
Strategy	• Peak inflows into Wivenhoe in excess of 12000 cumecs. • Increase releases to maintain fuse plug and dam integrity. • Close sluices at Somerset Dam to store more water however will affect upstream areas.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 1,500,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset/Wivenhoe

Our strategy revolves ensuring dam security and is around trying to prevent initiation of the first fuse plug at EL 75.6m. If this happens we will get a rapid increase of about 2,000m3/s in outflow from the dam in addition to the gate release which could be as high as 10,000m3/s at the time.

Sluices have been closed at Somerset and this will result in high upstream water levels affecting Kilcoy. Somerset is at 104.7m holding 691,500ML and 180.2%.

Somerset should peak at around 105.2m (1974 peak level was 106.5m).

At 2000 Wivenhoe Dam was 74.97m AHD holding 2,227,000ML and 191.1% and steady and releasing about 7,500m3/s.

The levels have stayed the same for an hour so there are no planned increases in releases.

As soon as the levels show they are dropping, releases will be reduced.

The dam is now expected to peak around 74.97m AHD which is around 600mm below the first fuse plug initiation level.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is also maintaining close contact with warning agencies and local councils.

It should be noted that the flow in the lower Brisbane R in 1974 was about 9,500m3/s

North Pine Dam:
Five gates are open and continuing to drop. Releases may still continue until Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Wyralong Dam

As at 5:00pm today 9,680ML/day was passing over the spillway at Wyaralong Dam. This represents a water depth of 0.59m over the spillway. The water level is continuing to rise. Wyaralong Dam Alliance will continue to monitor and advise of water levels and flows.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to lotest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager

BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time	PM	or Event		

[redacted]

From: [redacted]
Sent: Tuesday, 11 January 2011 8:33 PM
To: [redacted]
Cc: [redacted] Barry Dennien; Dan Spiller; [redacted]
Subject: Release Update

Categories: T8

As at 8.30 pm on Tuesday 11 January, the following applies:

SOMERSET DAM:
Releases have stopped, however levels in Somerset are expected to continue rising and areas around Kilcoy are likely to be impacted.

WIVENHOE DAM:
Wivenhoe Dam is currently releasing about 654,000 megalitres per day.

The levels have stayed the same for an hour so at this stage there are no planned increases in releases.

As soon as the levels show they are consistently dropping, releases will be reduced.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes.

The Centre is also maintaining close contact with warning agencies and local councils.

NORTH PINE DAM:
Five gates are open, and will continue until at least Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

LESLIE HARRISON DAM:
Gate releases are underway due to rainfall and inflows.

HINZE DAM:
A minor release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

For detailed information on river levels, road and crossing closures and other potential impacts, always contact your local council.

This information will be updated in the event of a significant change.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Tuesday, 11 January 2011 9:16 PM
To: Rob Drury; Dan Spiller [redacted]; Peter Borrows;
Cc: [redacted]
Subject: RE: Technical Report
Attachments: Technical Situation Report W44.docx

Attached report.

Dam has peaked (assuming no more rain) and release reduction has been initiated.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W44	Date of TSR release	11.1.2011	Time of TSR release	8pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Initiate the gradual reduction of releases.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Maintain controlled releases. • Keep sluices closed at Somerset Dam to store more water however will affect upstream areas.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 1,500,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset/Wivenhoe

Our strategy revolves ensuring dam security and is around trying to prevent initiation of the first fuse plug at EL 75.6m. If this happens we will get a rapid increase of about 2,000m3/s in outflow from the dam in addition to the gate release which could be as high as 10,000m3/s at the time.

Sluices have been closed at Somerset and this will result in high upstream water levels affecting Kilcoy. Somerset is at 104.78m holding 697,400ML and 183.6%.

Somerset should peak at around 105.2m (1974 peak level was 106.5m).

At 2100 Wivenhoe Dam was 74.95m AHD holding 2,223,000ML and 190.8% and slowly dropping.

The levels have now stabilized and commenced to fall slowly.

The FOC has begun an appropriate closure sequence to reduce releases.

Assuming no further rain, the dam has now peaked around 74.97m AHD which was around 600mm below the first fuse plug initiation level.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is also maintaining close contact with warning agencies and local councils.

It should be noted that the flow in the lower Brisbane R in 1974 was about 9,500m3/s

North Pine Dam:
Five gates are open and continuing to drop. Releases may still continue until Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas ond depths of inundation based an the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time	PM	or Event	

[redacted]

From: John Adcock
Sent: Tuesday, 11 January 2011 9:25 PM
To: Barry Dennien; Dan Spiller; [redacted]
Cc: [redacted]
Subject: FW: Seqwater Storage Capacities Update at 21:00hrs on Tuesday 11 Jan 2011

Importance: High

Categories: T8

FYI

From: [redacted]
Sent: Tuesday, 11 January 2011 9:19 PM
To: [redacted] John Adcock
Cc: [redacted]
Subject: FW: Seqwater Storage Capacities Update at 21:00hrs on Tuesday 11 Jan 2011

Hi all,

Wivenhoe's level receded 20mm in the last hour.
Somerset's level climbed 80mm in last hour.

.

seqwater

Dam Capacities on 11 January 2011

Dam	FSL		11/01/2011 20:00		11/01/2011 21:00			Capac Chang last
	Level	Actual	Level	Capacity	Level	Capacity		
	m AHD	ML	m AHD	ML	m AHD	ML	%	%
Atkinson Dam	65.72	30,488	65.77	30,709	65.77	**30,709**	100.7%	0
Baroon Pocket Dam	217.00	61,000	219.43	72,150	219.32	**71,600**	117.4%	0
Bill Gunn Dam	110.00	6,947	110.58	7,632	110.57	**7,618**	109.7%	0
Borumba Dam	135.01	45,952	136.35	52,699	136.35	**52,699**	114.7%	0
Bromelton Dam	44.50	8,210	44.34	8,051	44.34	**8,051**	98.1%	0
Cedar Pocket Dam	101.07	730	101.36	794	101.36	**794**	108.7%	0
Cooloolabin Dam	296.00	13,820	296.36	14,630	296.34	**14,583**	105.5%	0
Enoggera Dam	74.37	4,567	77.56	6,471	77.45	**6,401**	140.2%	1
Ewen Maddock Dam	25.38	16,587	26.54	21,574	26.50	**21,388**	128.9%	1
Gold Creek Dam	92.75	801	96.06	1,472	96.02	**1,464**	182.8%	1
Hinze Dam	82.20	161,073	84.11	180,537	84.11	**180,537**	112.1%	0
Lake Clarendon Dam	96.00	24,276	105.05		105.05			0
Lake Kurwongbah (Sideling Creek Dam)	20.42	14,370	21.18	17,366	21.18	**17,366**	120.8%	0
Lake MacDonald Dam	95.32	8,018	95.57	8,690	95.57	**8,690**	108.4%	0
Lake Manchester Dam	50.90	26,217	52.73	31,511	52.63	**31,207**	119.0%	1
Leslie Harrison Dam	18.32	24,868	18.16	24,196	18.15	**24,158**	97.1%	0
Little Nerang Dam	168.02	6,705	168.64	6,981	168.64	**6,981**	104.1%	0
Maroon Dam	207.14	44,319	209.83	53,831	209.88	**54,015**	121.9%	0
Moogerah Dam	154.91	83,765	157.62	107,738	157.00	**101,970**	121.7%	6
Nindooinbah Dam	122.80	322						0
North Pine Dam	39.60	214,302	40.23	228,320	40.06	**224,481**	104.7%	1
Poona Dam	152.70	655	152.81	675	152.80	**673**	102.7%	0
Somerset Dam	**99.00**	**379,849**	**104.70**	**691,510**	**104.78**	**697,401**	**183.6%**	**1**
Wappa Dam	44.81	4,694	48.37	7,631	48.37	**7,631**	162.6%	0
Wivenhoe Dam	**67.00**	**1,165,238**	**74.97**	**2,227,090**	**74.95**	**2,223,855**	**190.8%**	**0**
Splityard Creek Dam			157.60	20,188	157.55	20,144		0
Adjusted Wivenhoe Dam	**67.00**	**1,165,238**		**2,224,918**		**2,221,699**	**190.7%**	**0**
Total - North Pine, Somerset & Wivenhoe		**1,759,389**		**3,144,748**		**3,143,581**	**178.7%**	0
Total - All		**2,347,773**		**3,800,086**		**3,792,116**	**161.5%**	0

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

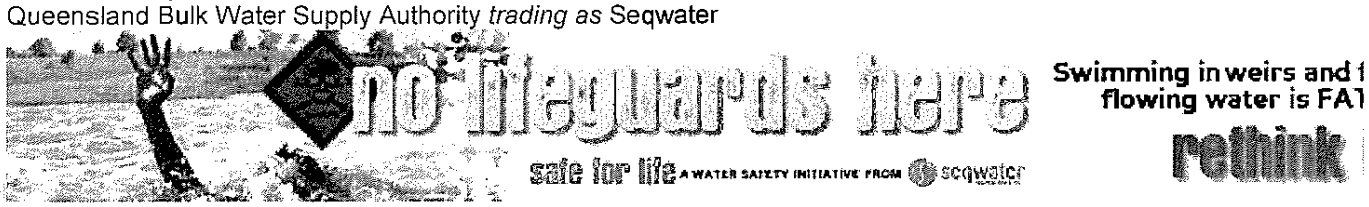
[redacted]

From: [redacted]
Sent: Tuesday, 11 January 2011 9:33 PM
To: Dan Spiller
Subject: RE: Technical Report

Categories: T8

Just figured out what you meant, will send a new one through in a minute.

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Dan Spiller [redacted]
Sent: Tuesday, 11 January 2011 9:33 PM
To: Rob Drury
Subject: Re: Technical Report

Sorry, I meant release rates. You note the closure sequence, but not from what.

On 11/01/2011, at 9:31 PM, "Rob Drury" [redacted] wrote:

> Sure,
>
> I had the volumes of the dams in there, which volumes did you mean?
>
> Rob
>
> **Robert Drury**

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.jpg>

<image002.png>

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

From: Dan Spiller [redacted]
Sent: Tuesday, 11 January 2011 9:28 PM
To: Rob Drury
Subject: Re: Technical Report

Rob,

We will distribute this version widely. Can you pls update to state volumes?

Dan

On 11/01/2011, at 9:15 PM, "Rob Drury" [redacted] wrote:

> Attached report.
>
> Dam has peaked (assuming no more rain) and release reduction has been initiated.
>
> Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.jpg>

<image002.png>

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

<Technical Situation Report W44.docx>

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

----------Safe Stamp----------
--
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error

please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Rob Drury [redacted]
Sent: Tuesday, 11 January 2011 9:51 PM
To: Dan Spiller
Subject: RE: Technical Report
Attachments: Technical Situation Report W44.docx

Categories: T8

Dan,
Updated report.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater





seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Dan Spiller [redacted]
Sent: Tuesday, 11 January 2011 9:33 PM
To: Rob Drury
Subject: Re: Technical Report

Sorry, I meant release rates. You note the closure sequence, but not from what.

On 11/01/2011, at 9:31 PM, "Rob Drury" [redacted] wrote:

> Sure,
>
> I had the volumes of the dams in there, which volumes did you mean?
>
> Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.jpg>

<image002.png>

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

From: Dan Spiller [redacted]
Sent: Tuesday, 11 January 2011 9:28 PM
To: Rob Drury
Subject: Re: Technical Report

Rob,

We will distribute this version widely. Can you pls update to state volumes?

Dan

On 11/01/2011, at 9:15 PM, "Rob Drury" [redacted] wrote:

> Attached report.
>
> Dam has peaked (assuming no more rain) and release reduction has been initiated.

Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.jpg>

<image002.png>

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

<Technical Situation Report W44.docx>

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

----------Safe Stamp----------
--
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the

addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W44	Date of TSR release	11.1.2011	Time of TSR release	8pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Initiate the gradual reduction of releases.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Maintain controlled releases. • Keep sluices closed at Somerset Dam to store more water however will affect upstream areas.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 1,500,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset/Wivenhoe

Our strategy revolves ensuring dam security and is around trying to prevent initiation of the first fuse plug at EL 75.6m. If this happens we will get a rapid increase of about 2,000m3/s in outflow from the dam in addition to the gate release which could be as high as 10,000m3/s at the time.

Sluices have been closed at Somerset and this will result in high upstream water levels affecting Kilcoy. Somerset is at 104.78m holding 697,400ML and 183.6%.

Somerset should peak at around 105.2m (1974 peak level was 106.5m).

At 2100 Wivenhoe Dam was 74.95m AHD holding 2,223,000ML and 190.8% and slowly dropping.

The levels have now stabilized and commenced to fall slowly.

The FOC has begun an appropriate closure sequence to reduce releases.
Releases will be reduced slowly throughout the night to track dropping levels. First reduction will be to around 7,100cumecs.

Assuming no further rain, the dam has now peaked around 74.97m AHD which was around 600mm below the first fuse plug initiation level.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is also maintaining close contact with warning agencies and local councils.

It should be noted that the flow in the lower Brisbane R in 1974 was about 9,500m3/s

North Pine Dam:
Five gates are open and continuing to drop. Releases may still continue until Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	11.1.2011	**Time**	PM	**or Event**		

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Tuesday, 11 January 2011 10:07 PM
To: Rob Drury; Dan Spiller; [redacted]; Peter Borrows;
Cc: [redacted]
Subject: RE: Technical Report
Attachments: Technical Situation Report W45.docx

Attached report W45.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W45	Date of TSR release	11.1.2011	Time of TSR release	10pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual reduction of releases.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Maintain controlled releases. • Keep sluices closed at Somerset Dam to store more water however will affect upstream areas.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 1,500,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset/Wivenhoe

Our strategy revolves ensuring dam security and is around trying to prevent initiation of the first fuse plug at EL 75.6m. If this happens we will get a rapid increase of about 2,000m3/s in outflow from the dam in addition to the gate release which could be as high as 10,000m3/s at the time.

Sluices have been closed at Somerset and this will result in high upstream water levels affecting Kilcoy. Somerset is at 104.85m holding 702,260ML and 185%.

Somerset should peak at around 105.2m (1974 peak level was 106.5m).

At 2200 Wivenhoe Dam was 74.95m AHD holding 2,223,000ML and 190.8%.

The FOC has begun an appropriate closure sequence to reduce releases.
Releases will be reduced slowly throughout the night to track dropping levels. First reduction has been to around 7,100cumecs.

Assuming no further rain, the dam peaked around 74.97m AHD which was around 600mm below the first fuse plug initiation level.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is also maintaining close contact with warning agencies and local councils.

It should be noted that the flow in the lower Brisbane R in 1974 was about 9,500m3/s

North Pine Dam:
Five gates are open and continuing to drop. Releases may still continue until Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time	PM	or Event	

[redacted]

From: Dan Spiller
Sent: Tuesday, 11 January 2011 10:19 PM
To: [redacted]; Debbie Best; [redacted] Ken Smith [redacted]
Cc: Rob Drury [redacted]; Barry Dennien; Peter Borrows; [redacted] SEQWGM [redacted]
Subject: Wivenhow Dam update
Attachments: Technical Situation Report W44.docx

Categories: T8

All,

Attached is the most recent technical situation report.

Note that Wivenhoe Dam levels have stabilised and are now falling slowly. Without further rainfall, release rates will be reduced progressively. The first reduction will be to 7,100 cubic metres per second.

Regards,
Daniel Spiller

TECHNICAL SITUATION REPORT

TSR Number	W44	Date of TSR release	11.1.2011	Time of TSR release	8pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Initiate the gradual reduction of releases.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Maintain controlled releases. • Keep sluices closed at Somerset Dam to store more water however will affect upstream areas.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 1,500,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset/Wivenhoe

Our strategy revolves ensuring dam security and is around trying to prevent initiation of the first fuse plug at EL 75.6m. If this happens we will get a rapid increase of about 2,000m3/s in outflow from the dam in addition to the gate release which could be as high as 10,000m3/s at the time.

Sluices have been closed at Somerset and this will result in high upstream water levels affecting Kilcoy. Somerset is at 104.78m holding 697,400ML and 183.6%.

Somerset should peak at around 105.2m (1974 peak level was 106.5m).

At 2100 Wivenhoe Dam was 74.95m AHD holding 2,223,000ML and 190.8% and slowly dropping.

The levels have now stabilized and commenced to fall slowly.

The FOC has begun an appropriate closure sequence to reduce releases.
Releases will be reduced slowly throughout the night to track dropping levels. First reduction will be to around 7,100cumecs.

Assuming no further rain, the dam has now peaked around 74.97m AHD which was around 600mm below the first fuse plug initiation level.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is also maintaining close contact with warning agencies and local councils.

It should be noted that the flow in the lower Brisbane R in 1974 was about 9,500m3/s

North Pine Dam:
Five gates are open and continuing to drop. Releases may still continue until Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time	PM	or Event		

Litsupport Brisbane

From: Dan Spiller
Sent: Tuesday, 11 January 2011 10:19 PM
To: [redacted]u); [redacted]; John Bradley [redacted] Debbie Best [redacted] Ken Smith
Cc: Rob Drury [redacted] Barry Dennien; Peter Borrows; [redacted] SEQWGM Emergency; [redacted]
Subject: Wivenhow Dam update
Attachments: Technical Situation Report W44.docx

All,

Attached is the most recent technical situation report.

Note that Wivenhoe Dam levels have stabilised and are now falling slowly. Without further rainfall, release rates will be reduced progressively. The first reduction will be to 7,100 cubic metres per second.

Regards,
Daniel Spiller

TECHNICAL SITUATION REPORT

TSR Number	W44	Date of TSR release	11.1.2011	Time of TSR release	8pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Initiate the gradual reduction of releases.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Maintain controlled releases. • Keep sluices closed at Somerset Dam to store more water however will affect upstream areas.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 1,500,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset/Wivenhoe

Our strategy revolves ensuring dam security and is around trying to prevent initiation of the first fuse plug at EL 75.6m. If this happens we will get a rapid increase of about 2,000m3/s in outflow from the dam in addition to the gate release which could be as high as 10,000m3/s at the time.

Sluices have been closed at Somerset and this will result in high upstream water levels affecting Kilcoy. Somerset is at 104.78m holding 697,400ML and 183.6%.

Somerset should peak at around 105.2m (1974 peak level was 106.5m).

At 2100 Wivenhoe Dam was 74.95m AHD holding 2,223,000ML and 190.8% and slowly dropping.

The levels have now stabilized and commenced to fall slowly.

The FOC has begun an appropriate closure sequence to reduce releases.
Releases will be reduced slowly throughout the night to track dropping levels. First reduction will be to around 7,100cumecs.

Assuming no further rain, the dam has now peaked around 74.97m AHD which was around 600mm below the first fuse plug initiation level.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is also maintaining close contact with warning agencies and local councils.

It should be noted that the flow in the lower Brisbane R in 1974 was about 9,500m3/s

North Pine Dam:
Five gates are open and continuing to drop. Releases may still continue until Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting af references to latest Flaad Warning far the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain farecasts, Tropical Cyclone Warning etc) and ather updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundatian areas and depths af inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted lacal inundatian areas and depths af inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	11.1.2011	Time	PM	or Event	

[redacted]

From: [redacted]
Sent: Tuesday, 11 January 2011 10:21 PM
To: [redacted]
Cc: [redacted] Barry Dennien; Dan Spiller; [redacted]
Subject: Release Update

Categories: T8

For detailed information on river levels, road and crossing closures and other potential impacts, always contact your local council.

As at 10.30 pm on Tuesday 11 January, the following applies:

SOMERSET DAM:
Releases have stopped, however levels in Somerset are expected to continue rising and areas around Kilcoy are likely to be impacted.

WIVENHOE DAM:
The Flood Operations Centre has begun an appropriate closure sequence to reduce releases.

Releases will be reduced slowly throughout the night to track dropping levels. First reduction has been to around 610,000 megalitres per day.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes.

The Centre is also maintaining close contact with warning agencies and local councils.

NORTH PINE DAM:
Five gates are open, and will continue until at least Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

LESLIE HARRISON DAM:
Gate releases are underway due to rainfall and inflows.

HINZE DAM:
A minor release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

For detailed information on river levels, road and crossing closures and other potential impacts, always contact your local council.

This information will be updated in the event of a significant change.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received

this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: SEQWGM Media
Sent: Tuesday, 11 January 2011 10:33 PM
Subject: Water Grid Update - Dam Releases - 10.30pm

Categories: T8

MEDIA UPDATE
11 January 2011: Issued at 10.30pm

Controlled releases from Wivenhoe Dam decreasing

NOTE: All SEQ dams remain safe, stable and operating within their design specifications.

At 10pm Wivenhoe Dam was at 190 per cent with water levels falling slowly.

Controlled releases through Wivenhoe's five radial gates of 645,000 megalitres per day are expected to reduce slightly overnight due to easing rainfall.

Releases are being made in consultation with the Bureau of Meteorology and local councils and every effort to limit downstream impacts where possible is being made. Note that these large releases are necessary for the continued safe management of the dam.

Somerset Dam is at 183 per cent and releases into Wivenhoe are expected to recommence overnight however high upstream levels are expected to continue to affect Kilcoy.

Due to a combination of Lockyer Creek, local runoff and Wivenhoe releases, Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge Colleges Crossing, Fernvale Bridge, and Mt Crosby Weir Bridge may be inundated until at least Sunday 16 January. Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

All recreations areas around Somerset and Wivenhoe are closed, and given the dam levels and the need for safety around spillways, **we will not be able to facilitate any land-based media access to our sites today**.

Five gates are open at North Pine Dam and will continue until at least Wednesday 12 January. The local Council is being kept informed regarding Youngs Crossing.

Gate releases at Leslie Harrison Dam are underway due to rainfall and inflows.

Water has spilled from Wyaralong Dam after it exceeded 100 per cent capacity this morning.

A minor release of around 8,000 megalitres a day is being made through the emergency gates at Hinze Dam. There is no public access to the spillway.

For detailed information on river levels, road and crossing closures and other potential impacts, always contact your local council.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.



Litsupport Brisbane

From: Dan Spiller
Sent: Tuesday, 11 January 2011 10:48 PM
To: Bradley John
Cc: Barry Dennien
Subject: RE: Wivenhow Dam update

It warrants a discussion. On phone when suits you.

From: Bradley John [redacted]
Sent: Tuesday, 11 January 2011 10:44 PM
To: Dan Spiller
Cc: Barry Dennien
Subject: Re: Wivenhow Dam update

Thanks Dan

As an aside, I think we need to try to maintain the protocol on these through these most serious of events - I notice sitreps lately have had no comment from bom/councils or just "has been advised".

Wouldn't bear much scrutiny in an ex post review, noting recipients (Min, DsG, etc)

Happy to take your and barry's advice as to how this can be achieved.

John B

From: Dan Spiller [redacted]
Sent: Tuesday, January 11, 2011 10:18 PM
[redacted]; Bradley John; Best Debbie; [redacted]; Ken Smith [redacted]
Cc: Rob Drury [redacted]; Dennien Barry @ SEQWGM; Peter Borrows [redacted]; Media @ SEQWGM; SEQWGM Emergency [redacted]
Subject: Wivenhow Dam update

All,

Attached is the most recent technical situation report.

Note that Wivenhoe Dam levels have stabilised and are now falling slowly. Without further rainfall, release rates will be reduced progressively. The first reduction will be to 7,100 cubic metres per second.

Regards,
Daniel Spiller

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.

While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

```
+-------------------------------------------------------------+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+-------------------------------------------------------------+
```

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Tuesday, 11 January 2011 10:57 PM
To: Dan Spiller; Peter Borrows
Cc: Barry Dennien
Subject: Re: Morning update

Will do. Rob

From: Dan Spiller [redacted]
To: Rob Drury; Peter Borrows
Cc: Barry Dennien [redacted]
Sent: Tue Jan 11 22:38:32 2011
Subject: Morning update

Rob and Peter,

we understand that the next major media interview will be at 6am tomorrow.

To ensure sufficient time for briefing and preparation of materials, can you please provide a Technical Situation Report at 5am?

Thanks,
Dan

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Tuesday, 11 January 2011 11:21 PM
To: [redacted]; Peter Borrows;
Cc: [redacted]
Subject: RE: Technical Report
Attachments: Technical Situation Report W46.docx

Attached report W46.

Next report will be 5am Wednesday 12.1.2011.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W46	Date of TSR release	11.1.2011	Time of TSR release	11pm

Seqwater status of inflows and dam operations

Current status but could chonge based on inflows or rainfall.

Current objectives	• Gradual reduction of releases.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Maintain controlled releases. • Keep sluices closed at Somerset Dam to store more water however will affect upstream areas.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 1,500,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset/Wivenhoe

Our strategy revolves ensuring dam security and is around trying to prevent initiation of the first fuse plug at EL 75.6m. If this happens we will get a rapid increase of about 2,000m3/s in outflow from the dam in addition to the gate release which could be as high as 10,000m3/s at the time.

Sluices have been closed at Somerset and this will result in high upstream water levels affecting Kilcoy. Somerset is at 104.90m holding 705,730ML and 185.8%.

Somerset should peak at around 105.2m (1974 peak level was 106.5m).

At 2300 Wivenhoe Dam was 74.92m AHD holding 2,219,000ML and 190.4%.

The FOC has begun an appropriate closure sequence to reduce releases.
Releases will be reduced throughout the night to track dropping levels. Another reduction will commence around 23:30 to 6,100cumecs. Further reductions will occur over night.

Assuming no further rain, the dam peaked around 74.97m AHD which was around 600mm below the first fuse plug initiation level.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is also maintaining close contact with warning agencies and local councils.

It should be noted that the flow in the lower Brisbane R in 1974 was about 9,500m3/s

North Pine Dam:
Five gates are open and continuing to drop. Releases may still continue until Wednesday 12 January.

The local Council is being kept informed regarding Youngs Crossing.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	12.1.2011	Time	AM	or Event	

Litsupport Brisbane

From: Dan Spiller
Sent: Tuesday, 11 January 2011 11:43 PM
To: [redacted] Ken Smith [redacted]
Cc: Barry Dennien; [redacted]; 'Rob Drury'; [redacted] Emergency; [redacted] 'Damien Brown [redacted]
Subject: Updated Wivenhoe Dam releases
Attachments: image001.jpg; image002.png; Technical Situation Report W46.docx

All,

Updated report attached.

At 2300, Wivenhoe Dam was at 74.92m AHD (190.4%) and holding.

The Flood Operations Centre has commenced a closure sequence. At 2330, releases will be reduced to 6,100 cubic metres per second.

The centre will continue to monitor rainfall and inflows and adjust as necessary.

With releases having peaked, the next report will be provided at 0500.

Regards,
Dan

From: Rob Drury [redacted]
Sent: Tuesday, January 11, 2011 11:21 PM
To: Rob Drury; Dan Spiller; [redacted]; Peter Borrows; [redacted]
Cc: [redacted] Duty Seq
Subject: RE: Technical Report

Attached report W46.

Next report will be 5am Wednesday 12.1.2011.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W48	Date of TSR release	12.1.2011	Time of TSR release	8am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual reduction of releases.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Develop and implement closing plan for next 7 or so days	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 2,000,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

No significant rain has fallen over the catchments in the past twelve hours. Less than 10 to 15 millimeters of rainfall is expected over the next 24-48 hours.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 m AHD at 08:00 on 12 January 2011 and the dam is discharging 1,230 m3/s over the spillway. Sluice gates will be utilised to assist the draining of the flood storage compartment commencing later Wednesday. At 8am Somerset was 105.11m and 720,400ML at 189.7%.

Wivenhoe Dam peaked at 74.97 m AHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s. Wivenhoe Dam was 74.75 m AHD at 2,192,000ML and 188.1% at 07:30 and generally falling slowly.

The releases from Wivenhoe Dam have been temporarily reduced to 2,500 m3/s at 07:30 to allow the peak of Lockyer Creek to enter the Brisbane River. After the downstream peak in the lower Brisbane River has passed, releases will be increased to maximum of 3,500 m3/s. This release will then be maintained to drain the flood storage component within the required 7 days.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2 million megalitres.

North Pine

At 07:00 North Pine Dam was 39.78 mAHD falling and releasing about 105 m3/s. North Pine has

peaked at 41.11 mAHD at 14:00 on 11 January 1974 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML. It is expected that gates will be close later Wednesday or early Thursday

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and ather relevant Bureau forecasts and warnings (e.g. weather/rain farecasts, Tropical Cyclone Warning etc) and ather updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundatian based an the informatian)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	12.1.2011	**Time**	11am	**or Event**

From: Dan Spiller [redacted]
Sent: Tuesday, January 11, 2011 11:49 PM
To: [redacted]
Cc: Barry Dennien [redacted]
Subject: Dam release update

Colin,

A quick update on dam operations. I understand that the Flood Operations Centre has been speaking to your staff directly.

At 2300, Wivenhoe Dam was at 74.92m AHD (190.4%) and holding. Somerset is at 105.2m AHD (185.8%).

The Flood Operations Centre has commenced a closure sequence. At 2330, releases will be reduced to 6,100 cubic metres per second.

The centre will continue to monitor rainfall and inflows and adjust as necessary.

Please call on mobile if you have any queries.

Regards,
Dan

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Wednesday, 12 January 2011 5:31 AM
To: Rob Drury; Dan Spiller; [redacted] Peter Borrows; [redacted]
Cc: [redacted] Duty Seq
Subject: RE: Technical Report
Attachments: Technical Situation Report W47.docx

Attached report W47.

Current discharge is 4300cumecs and further reductions to drain the storages will occur. Somerset will also have to be released into Wivenhoe at some stage.

Next report later this morning.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W47	Date of TSR release	12.1.2011	Time of TSR release	5am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual reduction of releases.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Maintain controlled releases. • Keep sluices closed at Somerset Dam to store more water however will affect upstream areas.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 1,500,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset/Wivenhoe

Our strategy revolved ensuring dam security and was around trying to prevent initiation of the first fuse plug at EL 75.6m. If this happens we will get a rapid increase of about 2,000m3/s in outflow from the dam in addition to the gate release which could be as high as 10,000m3/s at the time.

Only minimal falls occurred overnight in the order of mm.

Sluices have been closed at Somerset and this will result in high upstream water levels affecting Kilcoy. Somerset is at 105.1m holding 719730ML and 189.5%. Some flows are going over the Somerset spillway.

Somerset should peak at around 105.2m (1974 peak level was 106.5m).

At 0500 Wivenhoe Dam was 74.77m AHD holding 2,195,287ML and 188%.

The FOC has begun an appropriate closure sequence to reduce releases.

Current release rate is 4,300cumecs.
Further reductions will occur throughout the week..

Assuming no further rain, the dam peaked around 74.97m AHD which was around 600mm below the first fuse plug initiation level.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is also maintaining close contact with warning agencies and local councils.

It should be noted that the flow in the lower Brisbane R in 1974 was about 9,500m3/s

North Pine Dam:
Five gates are open and continuing to drop. Releases may still continue until Wednesday 12 January. The event magnitude is estimated to be a 1:10,000 year excedance probability.

The local Council is being kept informed regarding Youngs Crossing.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths af inundation based on the infarmation)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted locol inundotion areas and depths of inundation based an the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	12.1.2011	Time	PM	or Event	

Litsupport Brisbane

From: Dan Spiller
Sent: Wednesday, 12 January 2011 5:37 AM
To: [redacted] Bradley John; [redacted] Best Debbie
Cc: Barry Dennien; Peter Borrows; Rob Drury; SEQWGM Media; SEQWGM Emergency; [redacted]
Subject: Dam release update
Attachments: Technical Situation Report W47.docx

All,

Attached is the most recent situation report.

There was minimum rainfall in the catchment last night, meaning that dam levels and release rates were reduced.

Wivenhoe Dam is currently at 188%, having peaked at about 191% (74.97m AHD, about 0.6m below the first fuse peak). Somerset Dam is at about 190%, which is its peak level.

Releases are now at 4,300 cubic metres per second (about 370,000 ML/day), having peaked at 7,500 cubic metres per second (about 650,000 ML/day) for a couple of hours.

We will update the report about every three hours. The next report will include more information about the closing sequence, including the broad timeframes for dam levels to be reduced. Note that, while dam levels are reducing, they remain at critical levels.

An update on water treatment will be provided later this morning.

Please call me on [redacted] if you require further information.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Email [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for

loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

TECHNICAL SITUATION REPORT

TSR Number	W47	Date of TSR release	12.1.2011	Time of TSR release	5am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual reduction of releases.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Maintain controlled releases. • Keep sluices closed at Somerset Dam to store more water however will affect upstream areas.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 1,500,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Somerset/Wivenhoe

Our strategy revolved ensuring dam security and was around trying to prevent initiation of the first fuse plug at EL 75.6m. If this happens we will get a rapid increase of about 2,000m3/s in outflow from the dam in addition to the gate release which could be as high as 10,000m3/s at the time.

Only minimal falls occurred overnight in the order of mm.

Sluices have been closed at Somerset and this will result in high upstream water levels affecting Kilcoy. Somerset is at 105.1m holding 719730ML and 189.5%. Some flows are going over the Somerset spillway.

Somerset should peak at around 105.2m (1974 peak level was 106.5m).

At 0500 Wivenhoe Dam was 74.77m AHD holding 2,195,287ML and 188%.

The FOC has begun an appropriate closure sequence to reduce releases.

Current release rate is 4,300cumecs.
Further reductions will occur throughout the week..

Assuming no further rain, the dam peaked around 74.97m AHD which was around 600mm below the first fuse plug initiation level.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is also maintaining close contact with warning agencies and local councils.

It should be noted that the flow in the lower Brisbane R in 1974 was about 9,500m3/s

North Pine Dam:
Five gates are open and continuing to drop. Releases may still continue until Wednesday 12 January. The event magnitude is estimated to be a 1:10,000 year excedance probability.

The local Council is being kept informed regarding Youngs Crossing.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Worning for the Brisbane River and other relevant Bureau forecosts ond wornings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updotes/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted locol inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation oreas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	12.1.2011	**Time**	PM	**or Event**	

[redacted]

From: [redacted]
Sent: Wednesday, 12 January 2011 6:01 AM
To: Dan Spiller
Cc: SEQWGM Emergency
Subject: Talking points approved and attached.....
Attachments: Talking points - Wivenhoe Dam increased releases - 12 January 2011 - 6.00am.doc

Categories: T8

Hi Dan,

Attached are the talking points for the Premier, approved by Seqwater.

Kindest regards

[redacted]
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

SEQ Water Grid

Talking Points

TRIM reference: D/11/	Enquiry received:
Purpose: Releases from Wivenhoe Dam – 12 January 2011	

Wivenhoe and Somerset dam levels and inflows

- Wivenhoe Dam is now at 188 per cent and Somerset Dam is now at 190 per cent.
- Wivenhoe Dam's level peaked at 191 per cent.
- Releases are now at 370,000 megalitres per day, having peaked at 645,000 for a period during the night.
- While levels are falling, we cannot be sure about the next few days hold,
- A strategy to release the remaining water held in the dam is being developed.
- While we are reducing the release rate, we must reduce the amount of water in storage so we are prepared in the event of further rainfall.
- in accordance with the approved plan, we will seek to empty the flood compartment within about a week.
- The operation of Wivenhoe Dam is a necessity, in order to relieve the dam's flood storage compartment.
- The Flood Operations Centre is continuing to monitor rainfall and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes.
- The Flood Operations Centre is also in close contact with the Bureau of Meteorology and local councils.
- When it comes to flooding, we will not take risks with South East Queensland's safety.

- It should be noted that the flow in the lower Brisbane River in 1974 was approximately 9,500 cubic metres per second, the next couple of days, the flows are looking to equal this.

- We are urging the community to contact telephone - 1800 613 122, which has been established for members of the public seeking information on which dams are spilling in South East Queensland.

- Members of the public seeking information on potential impacts in their local areas should direct inquiries to their **local councils.**

- We are letting water out of the dam in a controlled manner, to minimise impacts downstream. This is the flood protection that Wivenhoe Dam gives South East Queensland however, we must release water.

- All SEQ dams remain safe, stable and operating within their design specifications.

[redacted]

From: [redacted]
Sent: Wednesday, 12 January 2011 6:05 AM
To: SEQWGM Media; [redacted] Barry Dennien; Dan Spiller; [redacted]
Cc: [redacted] ELT
Subject: Release Update

Categories: T8

As at 6.00 am on Wednesday 12 January, the following applies:

SOMERSET DAM:
Releases have stopped, however levels in Somerset are expected to continue rising and areas around Kilcoy are likely to be impacted. Some releases are going over the spillway and releases into Wivenhoe will need to recommence in the near future.

WIVENHOE DAM:
The Flood Operations Centre has begun an appropriate closure sequence to reduce releases.

Releases have been reduced slowly during the night to drop levels and are currently at 369,800 megalitres per day.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes.

The Centre is also maintaining close contact with warning agencies and local councils.

NORTH PINE DAM:
Five gates are open, and will continue. It is expected with no further rain to close the gates today or tomorrow.

The local Council is being kept informed regarding Youngs Crossing.

LESLIE HARRISON DAM:
Gate releases are underway due to rainfall and inflows. It is expected that the dam release may finish later today.

HINZE DAM:
A minor release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

For detailed information on river levels, road and crossing closures and other potential impacts, always contact your local council.

This information will be updated during the morning of Wednesday January 12

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Barry Dennien
Sent: Wednesday, 12 January 2011 6:10 AM
To: Dan Spiller
Subject: Re: Briefed Colin Jensen verbally about Wivenhoe status

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: T8

Ta

Regards
Barry Dennien

On 12/01/2011, at 6:05 AM, "Dan Spiller" [redacted] wrote:

>
>

[redacted]

From: Barry Dennien
Sent: Wednesday, 12 January 2011 6:15 AM
To: Dan Spiller; Colin Jensen
Subject: Re: Dam release update

Categories: T8

Col

Further info

Regards
Barry Dennien

On 12/01/2011, at 5:37 AM, "Dan Spiller" [redacted] wrote:

All,

Attached is the most recent situation report.

There was minimum rainfall in the catchment last night, meaning that dam levels and release rates were reduced.

Wivenhoe Dam is currently at 188%, having peaked at about 191% (74.97m AHD, about 0.6m below the first fuse peak). Somerset Dam is at about 190%, which is its peak level.

Releases are now at 4,300 cubic metres per second (about 370,000 ML/day), having peaked at 7,5003D1&btmpl cubic metres per second (about 650,000 ML/day) for a couple of hours.

We will update the report about every three hours. The next report will include more information about the closing sequence, including the broad timeframes for dam levels to be reduced. Note that, while dam levels are reducing, they remain at critical levels.

An update on water treatment will be provided later this morning.

Please call me on [redacted] if you require further information.

Regards,

Dan

Daniel Spiller

Director, Operations

SEQ Water Grid Manager

[redacted]

Visit: Level 15, 53 Albert Street Brisbane

Post: PO Box 16205, City East QLD 4002

ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

<Technical Situation Report W47.docx>

[redacted]

From: [redacted]
Sent: Wednesday, 12 January 2011 6:37 AM
To: [redacted] Dan Spiller
Subject: RE: Water Grid Update - Dam Releases - 6.30am

Categories: T8

Ok from my end

[redacted]

Sent: Wednesday, 12 January 2011 06:35
To: Dan Spiller;[redacted]
Subject: Water Grid Update - Dam Releases - 6.30am

Hi Paul Hi Dan,

Please see below for immediate approval.

[redacted]

MEDIA UPDATE
12 January 2011: Issued at 6.30am

Controlled releases from Wivenhoe Dam decreasing

NOTE: All SEQ dams remain safe, stable and operating within their design specifications.

Currently, Wivenhoe Dam is at 188 per cent down from 191 per cent overnight. This reflects the current weather. Somerset Dam is now at 190 per cent.

Wivenhoe's five radial gates are currently releasing 370,000 megalitres per day, down from an overnight peak of 645,000 megalitres per day.

Although now reduced in volume, controlled releases must continue in order to relieve Wivenhoe Dam's flood storage compartment in order to create space for further rainfall and inflows.

These controlled releases are being made in consultation with the Bureau of Meteorology and local councils and every effort is being made to limit downstream impacts where possible.

Due to a combination of Lockyer Creek, local runoff and Wivenhoe releases, Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge Colleges Crossing, Fernvale Bridge, and Mt Crosby Weir Bridge may be inundated until at least Sunday 16 January. Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

All recreations areas around Somerset and Wivenhoe are closed, and given the dam levels and the need for safety around spillways, **we will not be able to facilitate any land-based media access to our sites today**.

Five gates are open at North Pine Dam, however with no further rainfall, the gates are expected to close today or tomorrow. The local Council is being kept informed regarding Youngs Crossing.

Gate releases at Leslie Harrison Dam are underway due to rainfall and inflows, however these may cease later today.

Water has spilled from Wyaralong Dam after it exceeded 100 per cent capacity yesterday morning.

A minor release of around 8,000 megalitres a day is being made through the emergency gates at Hinze Dam. There is no public access to the spillway.

For detailed information on river levels, road and crossing closures and other potential impacts, always contact your local council.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils**.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.



This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Dan Spiller
Sent: Wednesday, 12 January 2011 6:46 AM
To: [redacted]
Subject: RE: Water Grid Update - Dam Releases - 6.30am

Categories: T8

Approved, subject to [redacted] approving release (not content).

From: [redacted]
Sent: Wednesday, January 12, 2011 6:35 AM
To: Dan Spiller; [redacted]
Subject: Water Grid Update - Dam Releases - 6.30am

H[redacted] Hi Dan,

Please see below for immediate approval.

[redacted]

MEDIA UPDATE
12 January 2011: Issued at 6.30am

Controlled releases from Wivenhoe Dam decreasing

NOTE: All SEQ dams remain safe, stable and operating within their design specifications.

Currently, Wivenhoe Dam is at 188 per cent down from 191 per cent overnight. This reflects the current weather. Somerset Dam is now at 190 per cent.

Wivenhoe's five radial gates are currently releasing 370,000 megalitres per day, down from an overnight peak of 645,000 megalitres per day.

Although now reduced in volume, controlled releases must continue in order to relieve Wivenhoe Dam's flood storage compartment in order to create space for further rainfall and inflows.

These controlled releases are being made in consultation with the Bureau of Meteorology and local councils and every effort is being made to limit downstream impacts where possible.

Due to a combination of Lockyer Creek, local runoff and Wivenhoe releases, Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge Colleges Crossing, Fernvale Bridge, and Mt Crosby Weir Bridge may be inundated until at least Sunday 16 January. Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

All recreations areas around Somerset and Wivenhoe are closed, and given the dam levels and the need for safety around spillways, **we will not be able to facilitate any land-based media access to our sites today**.

Five gates are open at North Pine Dam, however with no further rainfall, the gates are expected to close today or tomorrow. The local Council is being kept informed regarding Youngs Crossing.

Gate releases at Leslie Harrison Dam are underway due to rainfall and inflows, however these may cease later today.

Water has spilled from Wyaralong Dam after it exceeded 100 per cent capacity yesterday morning.

A minor release of around 8,000 megalitres a day is being made through the emergency gates at Hinze Dam. There is no public access to the spillway.

For detailed information on river levels, road and crossing closures and other potential impacts, always contact your local council.

ENDS

Note to the Editor: While releases are being made from the region's water storages, routine updates will be provided.

Community Assistance: Please direct the community to contact **telephone - 1800 613 122.** This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking information on **potential impacts in their local areas** should **direct inquiries to their local councils.**

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.



Dan Spiller

From: Rob Drury [redacted]
Sent: Wednesday, 12 January 2011 7:58 AM
To: Dan Spiller
Subject: RE: Dam release update
Attachments: image001.jpg; image002.png

Rainfall

No significant rain has fallen over the catchments in the past twelve hours. Less than 10 to 15 millimeters of rainfall is expected over the next 24-48 hours.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 mAHD at 06:00 on 12 January 2011 and the dam is discharging 1,230 m3/s over the spillway. Sluice gates will be utilised to assist the draining of the flood storage compartment commencing later Wednesday.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s. Wivenhoe Dam was 74.75 m AHD at 07:30 and generally falling slowly.

The releases from Wivenhoe Dam have been temporarily reduced to 2,500 m3/s at 07:30 to allow the peak of Lockyer Creek to enter the Brisbane River. After the downstream peak in the lower Brisbane River has passed, releases will be increased to maximum of 3,500 m3/s. This release will then be maintained to drain the flood storage component within the required 7 days.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2 million megalitres.

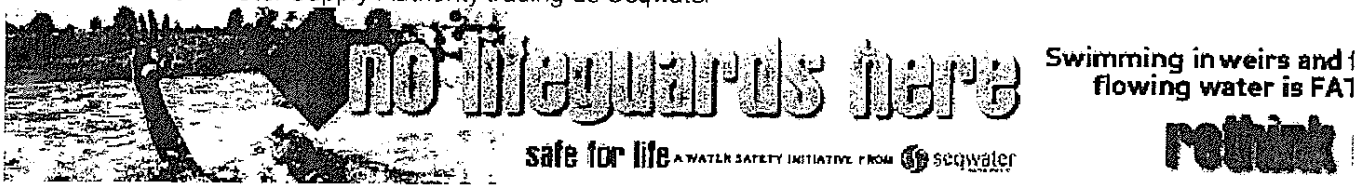
North Pine

At 07:00 North Pine Dam was 39.78 mAHD falling and releasing about 105 m3/s. North Pine has peaked at 41.11 mAHD at 14:00 on 11 January 1974 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML. It is expected that gates will be close later Wednesday or early Thursday.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Dan Spiller [redacted]
Sent: Wednesday, 12 January 2011 5:37 AM
To: [redacted] Bradley John; [redacted]; Best Debbie
Cc: Barry Dennien; Peter Borrows; Rob Drury; SEQWGM Media; SEQWGM Emergency; [redacted]
Subject: Dam release update

All,

Attached is the most recent situation report.

There was minimum rainfall in the catchment last night, meaning that dam levels and release rates were reduced.

Wivenhoe Dam is currently at 188%, having peaked at about 191% (74.97m AHD, about 0.6m below the first fuse peak). Somerset Dam is at about 190%, which is its peak level.

Releases are now at 4,300 cubic metres per second (about 370,000 ML/day), having peaked at 7,500 cubic metres per second (about 650,000 ML/day) for a couple of hours.

We will update the report about every three hours. The next report will include more information about the closing sequence, including the broad timeframes for dam levels to be reduced. Note that, while dam levels are reducing, they remain at critical levels.

An update on water treatment will be provided later this morning.

Please call me on [redacted] if you require further information.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

TECHNICAL SITUATION REPORT

TSR Number	W48	Date of TSR release	12.1.2011	Time of TSR release	8am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual reduction of releases.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Develop and implement closing plan for next 7 or so days	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 2,000,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

No significant rain has fallen over the catchments in the past twelve hours. Less than 10 to 15 millimeters of rainfall is expected over the next 24-48 hours.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 m AHD at 08:00 on 12 January 2011 and the dam is discharging 1,230 m3/s over the spillway. Sluice gates will be utilised to assist the draining of the flood storage compartment commencing later Wednesday. At 8am Somerset was 105.11m and 720,400ML at 189.7%.

Wivenhoe Dam peaked at 74.97 m AHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s. Wivenhoe Dam was 74.75 m AHD at 2,192,000ML and 188.1% at 07:30 and generally falling slowly.

The releases from Wivenhoe Dam have been temporarily reduced to 2,500 m3/s at 07:30 to allow the peak of Lockyer Creek to enter the Brisbane River. After the downstream peak in the lower Brisbane River has passed, releases will be increased to maximum of 3,500 m3/s. This release will then be maintained to drain the flood storage component within the required 7 days.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2 million megalitres.

North Pine

At 07:00 North Pine Dam was 39.78 mAHD falling and releasing about 105 m3/s. North Pine has

peaked at 41.11 mAHD at 14:00 on 11 January 1974 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML. It is expected that gates will be close later Wednesday or early Thursday

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	12.1.2011	**Time**	11am	**or Event**		

Litsupport Brisbane

From: Rob Drury[redacted]
Sent: Wednesday, 12 January 2011 8:21 AM
To: Rob Drury; Dan Spiller; [redacted]Peter Borrows; [redacted]
Cc: [redacted]Duty Seq
Subject: RE: Technical Report W48
Attachments: Technical Situation Report W48.docx

Attached report W48.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W48	Date of TSR release	12.1.2011	Time of TSR release	8am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or roinfall.

Current objectives	• Gradual reduction of releases.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Develop and implement closing plan for next 7 or so days	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 2,000,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

No significant rain has fallen over the catchments in the past twelve hours. Less than 10 to 15 millimeters of rainfall is expected over the next 24-48 hours.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 m AHD at 08:00 on 12 January 2011 and the dam is discharging 1,230 m3/s over the spillway. Sluice gates will be utilised to assist the draining of the flood storage compartment commencing later Wednesday. At 8am Somerset was 105.11m and 720,400ML at 189.7%.

Wivenhoe Dam peaked at 74.97 m AHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s. Wivenhoe Dam was 74.75 m AHD at 2,192,000ML and 188.1% at 07:30 and generally falling slowly.

The releases from Wivenhoe Dam have been temporarily reduced to 2,500 m3/s at 07:30 to allow the peak of Lockyer Creek to enter the Brisbane River. After the downstream peak in the lower Brisbane River has passed, releases will be increased to maximum of 3,500 m3/s. This release will then be maintained to drain the flood storage component within the required 7 days.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2 million megalitres.

North Pine

At 07:00 North Pine Dam was 39.78 mAHD falling and releasing about 105 m3/s. North Pine has

peaked at 41.11 mAHD at 14:00 on 11 January 1974 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML. It is expected that gates will be close later Wednesday or early Thursday

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	12.1.2011	**Time**	11am	**or Event**	

[redacted]

From: [redacted]
Sent: Wednesday, 12 January 2011 8:26 AM
To: SEQWGM Media; ELT[redacted]Barry Dennien; Dan Spiller[redacted]
Cc: [redacted]; John Adcock
Subject: Release Update

Categories: T8

As at 8.00 am on Wednesday 12 January, the following applies:

SOMERSET DAM:
Releases have stopped and the level in Somerset has almost peaked.
Some releases are going over the spillway and sluice releases into Wivenhoe will need to recommence later on Wednesday 12 January.

WIVENHOE DAM:
The Flood Operations Centre has begun an appropriate closure sequence to reduce releases.

The releases from Wivenhoe Dam have been temporarily reduced to 215,000 megalitres per day to allow the peak of Lockyer Creek to enter the Brisbane River.

After the downstream peak in the lower Brisbane River has passed, releases will be increased to maximum of 301,000 megalitres per day.

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes.

The Centre is also maintaining close contact with warning agencies and local councils.

NORTH PINE DAM:
Five gates are open, and will continue. It is expected with no further rain to close the gates today or tomorrow.

The local Council is being kept informed regarding Youngs Crossing.

LESLIE HARRISON DAM:
Gate releases are underway due to rainfall and inflows. It is expected that the dam release may finish later today.

HINZE DAM:
A minor release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

For detailed information on river levels, road and crossing closures and other potential impacts, always contact your local council.

RECREATION UPDATE:
Both Wivenhoe and Somerset are closed to all recreational activities.

The following recreation sites are closed –

- O'Sheas Crossing
- Hamon Cove
- Logan Inlet
- Captain Logan Camp
- Lumley Hill
- Spillway Common/ Atkinson's Crossing
- Cormorant Bay
- Branch Creek
- Billies Bay/Hays Landing
- The Spit
- Lake Somerset Holiday Park Kirkleagh
- Somerset Park Camping area

This information will be updated during the morning of Wednesday January 12

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Litsupport Brisbane

From: Dan Spiller
Sent: Wednesday, 12 January 2011 9:00 AM
To: [redacted] 'Best Debbie'
Cc: Barry Dennien; 'Peter Borrows'; 'Rob Drury'; SEQWGM Media; SEQWGM Emergency; [redacted]
Subject: Dam release update
Attachments: Technical Situation Report W48.docx

All,

Attached is an updated Technical Support Report, including advice about the gate closure process.

Note that releases have been reduced to 2,500 cubic metres per second while peak Lockyer Valley flows pass. Increases will then increase to 3,500 cubic metres per second.

Please call me on [redacted] if you require further information.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

TECHNICAL SITUATION REPORT

TSR Number	W48	Date of TSR release	12.1.2011	Time of TSR release	8am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual reduction of releases.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Develop and implement closing plan for next 7 or so days	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 2,000,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

No significant rain has fallen over the catchments in the past twelve hours. Less than 10 to 15 millimeters of rainfall is expected over the next 24-48 hours.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 m AHD at 08:00 on 12 January 2011 and the dam is discharging 1,230 m3/s over the spillway. Sluice gates will be utilised to assist the draining of the flood storage compartment commencing later Wednesday. At 8am Somerset was 105.11m and 720,400ML at 189.7%.

Wivenhoe Dam peaked at 74.97 m AHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s. Wivenhoe Dam was 74.75 m AHD at 2,192,000ML and 188.1% at 07:30 and generally falling slowly.

The releases from Wivenhoe Dam have been temporarily reduced to 2,500 m3/s at 07:30 to allow the peak of Lockyer Creek to enter the Brisbane River. After the downstream peak in the lower Brisbane River has passed, releases will be increased to maximum of 3,500 m3/s. This release will then be maintained to drain the flood storage component within the required 7 days.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2 million megalitres.

North Pine

At 07:00 North Pine Dam was 39.78 mAHD falling and releasing about 105 m3/s. North Pine has

peaked at 41.11 mAHD at 14:00 on 11 January 1974 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML. It is expected that gates will be close later Wednesday or early Thursday

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	12.1.2011	**Time**	11am	**or Event**	

Litsupport Brisbane

From: Dan Spiller
Sent: Wednesday, 12 January 2011 9:01 AM
To: [redacted]
Cc: Barry Dennien
Subject: FW: Dam release update
Attachments: Technical Situation Report W48.docx

Colin,

Further to our discussion earlier, attached is the release strategy.

Dan

From: Dan Spiller
Sent: Wednesday, January 12, 2011 9:00 AM
[redacted]
Cc: Barry Dennien; 'Peter Borrows'; 'Rob Drury'; SEQWGM Media; SEQWGM Emergency;
[redacted]
Subject: Dam release update

All,

Attached is an updated Technical Support Report, including advice about the gate closure process.

Note that releases have been reduced to 2,500 cubic metres per second while peak Lockyer Valley flows pass. Increases will then increase to 3,500 cubic metres per second.

Please call me on [redacted] if you require further information.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for

loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

TECHNICAL SITUATION REPORT

TSR Number	W48	Date of TSR release	12.1.2011	Time of TSR release	8am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual reduction of releases.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Develop and implement closing plan for next 7 or so days	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 2,000,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

No significant rain has fallen over the catchments in the past twelve hours. Less than 10 to 15 millimeters of rainfall is expected over the next 24-48 hours.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 m AHD at 08:00 on 12 January 2011 and the dam is discharging 1,230 m3/s over the spillway. Sluice gates will be utilised to assist the draining of the flood storage compartment commencing later Wednesday. At 8am Somerset was 105.11m and 720,400ML at 189.7%.

Wivenhoe Dam peaked at 74.97 m AHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s. Wivenhoe Dam was 74.75 m AHD at 2,192,000ML and 188.1% at 07:30 and generally falling slowly.

The releases from Wivenhoe Dam have been temporarily reduced to 2,500 m3/s at 07:30 to allow the peak of Lockyer Creek to enter the Brisbane River. After the downstream peak in the lower Brisbane River has passed, releases will be increased to maximum of 3,500 m3/s. This release will then be maintained to drain the flood storage component within the required 7 days.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2 million megalitres.

North Pine

At 07:00 North Pine Dam was 39.78 mAHD falling and releasing about 105 m3/s. North Pine has

peaked at 41.11 mAHD at 14:00 on 11 January 1974 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML. It is expected that gates will be close later Wednesday or early Thursday

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecosts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	12.1.2011	**Time**	11am	**or Event**	

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Wednesday, 12 January 2011 11:24 AM
To: Rob Drury; Dan Spiller; [redacted] Peter Borrows; [redacted]
Cc:
Subject: RE: Technical Report W49
Attachments: Technical Situation Report W49.docx

Attached report.

Starting to release from Somerset to start giving relief to Kilcoy area as space appears in Wivenhoe.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W49	Date of TSR release	12.1.2011	Time of TSR release	11am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual reduction of releases.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Develop and implement closing plan for next 7 or so days • Maintain lower releases until Lockyer peak has passed. • Begin dropping Somerset Dam to relieve upstream areas.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 1,500,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

No significant rain has fallen over the catchments in the past twelve hours. Less than 10 to 15 millimeters of rainfall is expected over the next 24-48 hours.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 m AHD at 08:00 on 12 January 2011 and the dam is discharging over the spillway.
One Sluice gate has been opened around 11am to assist the draining of the flood storage compartment. Further sluices may be opened during the day to relieve upstream impacts.
At 11am Somerset was 105.06m and 716,900ML at 188.7% and dropping slightly.

Wivenhoe Dam peaked at 74.97 m AHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.
At 11am Wivenhoe Dam was 74.78 m AHD at 2,197,000ML and 188.5% and generally steady.

The releases from Wivenhoe Dam have been temporarily reduced to 2,500 m3/s at 07:30 to allow the peak of Lockyer Creek to enter the Brisbane River. After the downstream peak in the lower Brisbane River has passed, releases will be increased to maximum of 3,500 m3/s. This release will then be maintained to drain the flood storage component within the required 7 days.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be around 2.3 million megalitres.

North Pine

At 11:00 North Pine Dam was 39.77 mAHD and falling and still releasing from 5 gates.
North Pine has peaked at 41.11 mAHD at 14:00 on 11 January 1974 with peak release of 2,800 m3/s.
The event has a volume of around 200,000 ML. It is expected that gates will now not close until Thursday or Friday.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin

BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	12.1.2011	Time	2pm	or Event		

[redacted]

Subject: Releases and flooding Teelconference
Location: WGM EMR or teleconference

Start: Wed 12/01/2011 11:30 AM
End: Wed 12/01/2011 12:00 PM
Show Time As: Tentative

Recurrence: Daily
Recurrence Pattern: every day from 11:30 AM to 12:00 PM

Meeting Status: Not yet responded

Organizer: [redacted]
Required Attendees: Dan Spiller; Barry Dennien; [redacted]
(Seqwater) [redacted]

Categories: T8

Phone no: [redacted]
Acct: [redacted]
Code: 4045

Please ensure appropriate people dial in.

Dan Spiller

From: Robert Drury [redacted]
Sent: Wednesday, 12 January 2011 3:36 PM
To: Dan Spiller; Dan Spiller
Attachments: Technical_Situation_Report_W50.docx

TECHNICAL SITUATION REPORT

TSR Number	W50	Date of TSR release	12.1.2011	Time of TSR release	3pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area • Maintain reduced release from Wivenhoe until Lockyer flows are reduced and then increase to discharge flood waters over 7 days	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 2,300,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Rainfall in the last 12 hours is generally below 5mm with a couple of 10mm falls in the Stanley and North Pine catchments. There is no significant rain expected fin the next 4 days.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 m AHD at 08:00 on 12 January 2011 and the dam has been discharging over the spillway. One sluice was opened at 1030 12 January 2011 and the dam is discharging 1,440 m3/s. Sluice gates will be utilised to drain of the flood storage compartment during the next 5 days.

At 3pm Somerset was 104.94m and 708,505ML at 186.5%.

Wivenhoe Dam peaked at 74.97 m AHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s

The releases from Wivenhoe Dam have been temporarily reduced to 2,500 m3/s at 07:30 to allow the peak of Lockyer Creek to enter the Brisbane River. After the downstream peak in the lower Brisbane River has passed, releases will be increased to maximum of 3,500 m3/s. This release will then be maintained to drain the flood storage component within the required 7 days.

At 3pm Wivenhoe Dam was 74.81 m AHD at 2,201,636ML and 188.9% and fluctuating slightly due to the releases coming from Somerset but relatively steady.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be approximately 2.6 million megalitres.

North Pine

North Pine peaked at 41.11 mAHD at 14:00 on 11 January 1974 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML.

At 3.00pm North Pine Dam was 39.74 mAHD and 217,370 ML and 101.4% and slowly falling. It is expected that gates will be closed Thursday or Friday.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	12.1.2011	**Time**	8pm	**or Event**		

Litsupport Brisbane

From: Dan Spiller
Sent: Wednesday, 12 January 2011 3:52 PM
To: [redacted] 'Bradley John'; [redacted] 'Best Debbie'
Cc: Barry Dennien; 'Peter Borrows'; 'Rob Drury'; SEQWGM Media; SEQWGM Emergency; [redacted]
Subject: Dam release update
Attachments: Technical_Situation_Report_W50.docx

All,

Attached is an updated Technical Support Report, including advice about the gate closure process.

The Wivenhoe Dam release rate has been maintained at 2,500 cubic metres per second. Dam levels have reduced slightly.

Please call me on [redacted] if you require further information.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

TECHNICAL SITUATION REPORT

TSR Number	W50	Date of TSR release	12.1.2011	Time of TSR release	3pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area • Maintain reduced release from Wivenhoe until Lockyer flows are reduced and then increase to discharge flood waters over 7 days	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 2,300,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Rainfall in the last 12 hours is generally below 5mm with a couple of 10mm falls in the Stanley and North Pine catchments. There is no significant rain expected fin the next 4 days.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 m AHD at 08:00 on 12 January 2011 and the dam has been discharging over the spillway. One sluice was opened at 1030 12 January 2011 and the dam is discharging 1,440 m3/s. Sluice gates will be utilised to drain of the flood storage compartment during the next 5 days.

At 3pm Somerset was 104.94m and 708,505ML at 186.5%.

Wivenhoe Dam peaked at 74.97 m AHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s

The releases from Wivenhoe Dam have been temporarily reduced to 2,500 m3/s at 07:30 to allow the peak of Lockyer Creek to enter the Brisbane River. After the downstream peak in the lower Brisbane River has passed, releases will be increased to maximum of 3,500 m3/s. This release will then be maintained to drain the flood storage component within the required 7 days.

At 3pm Wivenhoe Dam was 74.81 m AHD at 2,201,636ML and 188.9% and fluctuating slightly due to the releases coming from Somerset but relatively steady.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be approximately 2.6 million megalitres.

North Pine

North Pine peaked at 41.11 mAHD at 14:00 on 11 January 1974 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML.

At 3.00pm North Pine Dam was 39.74 mAHD and 217,370 ML and 101.4% and slowly falling. It is expected that gates will be closed Thursday or Friday.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gate releases are underway due to rainfall and inflows.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundatian areas and depths of inundation based an the infarmatian)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths af inundation based an the infarmation)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	12.1.2011	Time	8pm	or Event	

Dan Spiller

From: Water Grid Emergency Manager [redacted]
Sent: Wednesday, 12 January 2011 7:12 PM
To: Dan Spiller
Subject: Fwd: Technical Report
Attachments: Technical_Situation_Report_W51.docx; Technical_Situation_Report_W51.doc

Attached is the latest Technical Report.

There are no planned significant changes over night so the next report will be tomorrow morning.

Dan, is 8am okay or do you need it early again? I usually get the FOC status between 6 and 6.30am.

There are 2 copies in different Word format.

Rob

TECHNICAL SITUATION REPORT

TSR Number	W51	Date of TSR release	12.1.2011	Time of TSR release	6pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area • Maintain reduced release from Wivenhoe until Lockyer flows are reduced and then increase to discharge flood waters over 7 days	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 2,300,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Rainfall in the last 12 hours is generally below 5mm with a couple of 10mm falls in the Stanley and North Pine catchments. There is no significant rain expected fin the next 4 days.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 mAHD at 06:00 on 12 January 2011. One sluice was opened at 1030 12 January 2011 and discharging 1,410 m3/s. Sluice gates will be utilised to drain of the flood storage compartment during the next 5 days.

At 5pm Somerset was 104.86m and 702,953ML at 185.1%.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

The release from Wivenhoe Dam was reduced to 2,500 m3/s at 07:30 12 January 2011 to allow the peak of Lockyer Creek to enter the Brisbane River and this release has been maintained since. After the downstream peak in the lower Brisbane River has passed, releases will be increased to maximum of 3,500 m3/s. The release is expected to commence Thursday and then be maintained at this level to drain the flood storage component within the required 7 days. The releases will not result in any renewed rises at downstream locations.

At 5pm Wivenhoe Dam was 74.82 m AHD at 2,203,223ML and 189.1% and fluctuating slightly due to the releases coming from Somerset but relatively steady.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be approximately 2.6 million megalitres.

North Pine

At 17:00 North Pine Dam had all gates open 1 increment, releasing about 80 m3/s. North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At 5.00pm North Pine Dam was 39.74 mAHD and 217,370 ML and 101.4% and slowly falling. It is expected that gates will be closed Thursday or Friday.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gate releases finished late this afternoon.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	13.1.2011	**Time**	8am	**or Event**		

Litsupport Brisbane

From: Dan Spiller
Sent: Wednesday, 12 January 2011 8:34 PM
To: [redacted]u'; 'Bradley John'; [redacted]'; [redacted]'Best Debbie'
Cc: Barry Dennien; 'Peter Borrows'; 'Rob Drury'; SEQWGM Media; SEQWGM Emergency; [redacted]
Subject: RE: Dam release update
Attachments: Technical_Situation_Report_W51.docx

All,

Attached is an updated Technical Support Report.

Please call me on [redacted] if you require further information.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

TECHNICAL SITUATION REPORT

TSR Number	W51	Date of TSR release	12.1.2011	Time of TSR release	6pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area • Maintain reduced release from Wivenhoe until Lockyer flows are reduced and then increase to discharge flood waters over 7 days	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 2,300,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Rainfall in the last 12 hours is generally below 5mm with a couple of 10mm falls in the Stanley and North Pine catchments. There is no significant rain expected fin the next 4 days.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 mAHD at 06:00 on 12 January 2011. One sluice was opened at 1030 12 January 2011 and discharging 1,410 m3/s. Sluice gates will be utilised to drain of the flood storage compartment during the next 5 days.

At 5pm Somerset was 104.86m and 702,953ML at 185.1%.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

The release from Wivenhoe Dam was reduced to 2,500 m3/s at 07:30 12 January 2011 to allow the peak of Lockyer Creek to enter the Brisbane River and this release has been maintained since. After the downstream peak in the lower Brisbane River has passed, releases will be increased to maximum of 3,500 m3/s. The release is expected to commence Thursday and then be maintained at this level to drain the flood storage component within the required 7 days. The releases will not result in any renewed rises at downstream locations.

At 5pm Wivenhoe Dam was 74.82 m AHD at 2,203,223ML and 189.1% and fluctuating slightly due to the releases coming from Somerset but relatively steady.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be approximately 2.6 million megalitres.

North Pine

At 17:00 North Pine Dam had all gates open 1 increment, releasing about 80 m3/s. North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At 5.00pm North Pine Dam was 39.74 mAHD and 217,370 ML and 101.4% and slowly falling. It is expected that gates will be closed Thursday or Friday.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gate releases finished late this afternoon.

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	13.1.2011	Time	8am	or Event	

[redacted]

From: Dan Spiller
Sent: Thursday, 13 January 2011 3:03 AM
To: [redacted]

Subject: FW: draft Media Release
Attachments: MEDIA RELEASE_Residents and Businesses urged to use water wisely_13 January 2011.doc

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: T8

For your approval.

From: WaterGridMedia [redacted]
Sent: Thursday, January 13, 2011 3:01 AM
To: Dan Spiller
Subject: draft Media Release

Dan

Draft approved by Qld Health for on forwarding and approval to John Bradley and Geoff Stead.

Regards
John

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

Water Grid

Media Release

MEDIA RELEASE– 0630h
13 JANUARY 2011

RESIDENTS AND BUSINESSES URGED TO USE WATER WISELY

The connected Water Grid continues to maintain safe and secure water supplies in the face of unprecedented flooding.

"While some people may see minor discolouration of their tap water, they should not be concerned" said Queensland Premier Anna Bligh.

"Water across Ipswich, Brisbane and the Sunshine and Gold Coasts remains safe to drink" she said.

"The safety of our drinking water is a critical priority. Water Grid suppliers are continually monitoring water quality across the network as well as working closely with Queensland Health".

While drinking water continues to be safe, very high sediment levels have limited production from some key water treatment plants.

Adequate water supplies will be necessary for the clean-up in coming days.

"It is really important that we all use our precious drinking water wisely over coming days" said Premier Bligh.

"Our priority must be on the clean-up of immediately impacted areas" she said.

Within areas affected by flooding, residents should use what water is needed to clean-up immediate impacts. Sensible water conservation practices are strongly encouraged such as using a high pressure hose or trigger nozzle.

Outside immediately impacted areas, residents and businesses are urged to conserve water by adopting the same water use practices that saw us through the drought. These include:

- take only short 4 minute showers
- don't water gardens
- delay washing your cars
- don't fill pools
- only use dishwashers when you have a full load
- turn-off taps when you don't need water

"During the drought we showed how well we could conserve water. During this latest crisis residents outside the directly impacted areas need to do the same again" Premier Bligh said.

ENDS

Notes to the editor

About the Water Grid

Established in June 2008 in response to the crippling Millennium Drought, the Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information visit www.watergrid.com.au

For further details contact the Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Litsupport Brisbane

From: Dan Spiller
Sent: Thursday, 13 January 2011 3:31 AM
To: [redacted]
Cc: Barry Dennien; [redacted] 'Best Debbie';
Subject: Update on Water Grid supply situation
Attachments: Water balance_130111.docx

Update attached for information.

Please call me on [redacted] if you require any further information.

Regards,
Daniel Spiller

Central SEQ water balance

- On 12 January 2011, bulk water storage in central South East Queensland (Brisbane, Ipswich and Logan) reduced by a third from 338 to 215 ML.
- Most of the reduction was due to both of the Mt Crosby water treatment plants being taken offline.
    - The East Bank water treatment plant was partially inundated, forcing it to be shutdown for at least two days. Recovery is underway.
    - Raw water quality reduced during the day, causing treated water from the West Bank water treatment plant to exceed standard operational limits. Raw water quality increased from 1100 to 1700 NTU during the day.
- Without supply from Mt Crosby, key reservoirs around Ipswich would have been depleted on 13 January 2011.
- **Table 1** lists expected production on 13 January. These are maximum production values, excluding any allowance for mechanical or other failures. By comparison, total production on 12 January was less than 200 ML due to Mt Crosby WTP being offline for much of the day and the Northern Pipeline Interconnector supplying north rather than south.
- The table also includes an indication of additional supplies that could potentially become available on 14 January, as the clean up commences. These additional supplies are subject to operational considerations, such as rectification of flood damage. Only some of these supplies are likely to become available.

Table 1: Supply to central SEQ (Brisbane, Ipswich and Logan)

Source	Planned production 13 January (ML)	Potential additional production from 14 January (ML)
Northern Pipeline Interconnector	25	
North Pine WTP	100	50
Petrie WTP	0	
Mt Crosby West Bank WTP	150	50
Mt Crosby East Bank WTP	0	100
Eastern Pipeline Interconnector	7	
Logan interconnector	20	
Southern Regional Water Pipeline[1]	100	110
Enoggera WTP and Brisbane Aquifer Project	0	TBD
Total	**402**	

[1] Includes supply from desalination facility.

- These supplies exceed estimated demand scenarios for the clean up period in central SEQ, as illustrated in **Table 2**. Forecasts are based on:
    - the proportion of residences in the area that are likely to be inundated
    - for impacted areas, demand being about double typical consumption

- for other areas, demand being around current levels.

- The forecasts highlight the importance of water conservation outside of the impacted areas, as a contingency against further operational issues (including an inability to bring on the potential additional supplies listed above).

Table 2: Estimated demand scenarios for clean up period in central SEQ (Brisbane, Ipswich and Logan)

Area	Typical	Low	Likely	High
Ipswich	42	55	61	67
Brisbane	270	265	294	324
Logan	48	43	48	53
Total	**360**	**363**	**403**	**443**

Mt Crosby operating arrangements

- As noted above, Mt Crosby West Bank WTP ceased production on 12 January 2011 due to treated water exceeding critical limits for normal operations.
- Alternative operating arrangements are now being applied, taking into account current catchment risks. These risks are considered to be considerably lessened, for a range of impacts including dilution.
- For the duration of the current flood event, the operating rules for the Mt Crosby water treatment plants are:
  - Minimum production of 150 ML/day
  - Achieve and maintain stable operation
  - Shutdown for operational reasons only, not treated water quality
  - Target of below 1 NTU in treated water
  - Periods of up to 2 NTU in treated water tolerable
  - Disinfection residual maintained at standard operating procedure
  - Note some discolouration may occur
- Queensland Health advised that:
  - Based on these operating rules, water supplied from the Mt Crosby water treatment plants is considered to have taken all necessary precautions to minimise the public health risk.
  - Further advice should be sought from Queensland Health should there be a prolonged trend to above 1.5 NTU in treated water. Production should not cease while this advice is sought. An evaluation will be made at that time to determine if water of above 2 NTU may still be safe to supply.

Mt Crosby critical logistics

- Continued operation of the Mt Crosby West Bank WTP is required to maintain water supplies in central SEQ.

- Chemical supplies are required in order to maintain continued operation. A dirt track is now accessible on the site, however supply routes from Brisbane are still flooded.
- Critical supplies are:
    - hypochlorite (2 days)
    - caustic soda (3 days)
    - alum (5 days).
- **Should supply routes not become open tomorrow, assistance will be required to transport chemicals to the site. Volumes required are relatively large.**
- Recommissioning of Mt Crosby East Bank WTP is a priority, to provide additional production and as a contingency in the event that chemicals are unable to be replenished at the site on the other side of the river.
- The East Bank WTP is both partially inundated and surrounded by flood waters, with access currently only able to be made by helicopter. A helicopter has been hired to transport additional staff to the WTP on the morning of 14 January. **It is critical that this helicopter not be reprioritised by EMQ.**

Western SEQ towns supplies

- Gatton is expected to run out of water overnight, following the loss of stored treated water.
- Supply is from the Lowood water treatment plant, which is offline due to loss of electricity and some operational issues. Energex has given electricity supply to the site a high priority.
- A number of smaller towns have already run out of supply or are expected to do so soon. QUU has started to supply bottled water to these towns via commercial helicopter.
- Tanker trucks will commence supply to towns as soon as they become accessible. **QUU is seeking advice about potential routes as they become available.**
- A boiled water notice is required when supply recommences after having run dry. A notice is required because of the risk of ingress into the pipelines. A number of these notices will be issued on 13 January 2011 for western towns.

Dan Spiller

From: Robert Drury [redacted]
Sent: Thursday, 13 January 2011 6:09 AM
To: Dan Spiller [redacted] Duty Engineer; [redacted]
Attachments: Technical_Situation_Report_W52.doc; Technical_Situation_Report_W52.docx

Attached report W52 in two formats.

Rob

TECHNICAL SITUATION REPORT

TSR Number	W52	Date of TSR release	13.1.2011	Time of TSR release	6am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact. .	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area • Maintain reduced release from Wivenhoe until Lockyer flows are reduced and then increase to discharge flood waters over 7 days	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 2,300,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Rainfall in the last 12 hours is generally below 5mm with isolated falls of up to 15mm in the Stanley, Lockyer and Pine River catchments. There is no significant rain expected fin the next 4 days.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 mAHD at 06:00 on 12 January 2011. One sluice was opened at 1030 12 January 2011 and discharging 1,410 m3/s. Sluice gates will be utilised to drain of the flood storage compartment during the next 5 days.

At 5am Somerset was 104.32m and 666,225ML at 175.39%.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

The releases from Wivenhoe Dam have been temporarily reduced to 2,500 m3/s at 07:30 on Wednesday 12 January 2011 to allow the peak of Lockyer Creek to enter the Brisbane River. The Brisbane River has peaked at the Port Office Gauge early Thursday morning. Releases from Wivenhoe Dam will be managed to achieve a target flow of around 3,500 m3/s at Moggill. This release will then be maintained to drain the flood storage component within the required 7 days.

At 5am Wivenhoe Dam was 74.74 m AHD at 2,194,043ML and 188.29% and dropping slowly due to the

releases coming from Somerset.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

At 17:00 North Pine Dam still gates open releasing about 80 m3/s. North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At 5.00am North Pine Dam was 39.70 mAHD and 216,494ML and 100.71% and slowly falling. It is expected that gates will be closed Friday.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gates closed..

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. The Lake Level is dropping. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	13.1.2011	Time	12pm	or Event

TECHNICAL SITUATION REPORT

TSR Number	W52	Date of TSR release	13.1.2011	Time of TSR release	6am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area • Maintain reduced release from Wivenhoe until Lockyer flows are reduced and then increase to discharge flood waters over 7 days	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over 2,300,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Rainfall in the last 12 hours is generally below 5mm with isolated falls of up to 15mm in the Stanley, Lockyer and Pine River catchments. There is no significant rain expected fin the next 4 days.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 mAHD at 06:00 on 12 January 2011. One sluice was opened at 1030 12 January 2011 and discharging 1,410 m3/s. Sluice gates will be utilised to drain of the flood storage compartment during the next 5 days.

At 5am Somerset was 104.32m and 666,225ML at 175.39%.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

The releases from Wivenhoe Dam have been temporarily reduced to 2,500 m3/s at 07:30 on Wednesday 12 January 2011 to allow the peak of Lockyer Creek to enter the Brisbane River. The Brisbane River has peaked at the Port Office Gauge early Thursday morning. Releases from Wivenhoe Dam will be managed to achieve a target flow of around 3,500 m3/s at Moggill. This release will then be maintained to drain the flood storage component within the required 7 days.

At 5am Wivenhoe Dam was 74.74 m AHD at 2,194,043ML and 188.29% and dropping slowly due to the

releases coming from Somerset.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

At 17:00 North Pine Dam still gates open releasing about 80 m3/s. North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At 5.00am North Pine Dam was 39.70 mAHD and 216,494ML and 100.71% and slowly falling. It is expected that gates will be closed Friday.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gates closed..

Hinze Dam:
A release of around 8,000 megalitres a day is being made through the emergency gates. The Lake Level is dropping. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted locol inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	13.1.2011	**Time**	12pm	**or Event**	

[redacted]

From: Rob Drury [redacted]
Sent: Thursday, 13 January 2011 1:09 PM
To: Dan Spiller; Peter Borrows; [redacted]
Cc: [redacted]

Subject: Technical Report W53
Attachments: Technical_Situation_Report_W53.docx

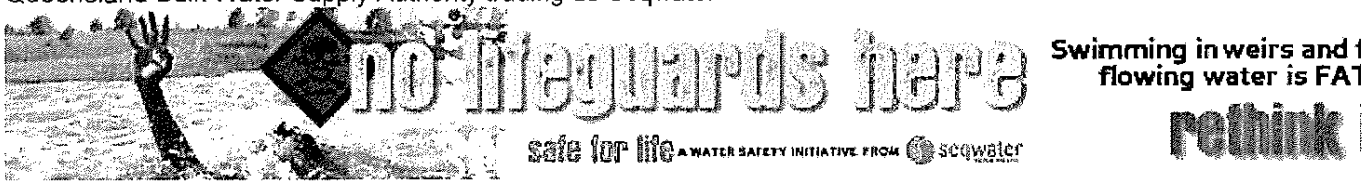
Categories: T8

Attached is the latest report.

Releases from Somerset are being increased to drain Somerset into Wivenhoe Dam.
Releases from Wivenhoe will be managed from 1pm today to maintain a flow of around 3500cumecs at Moggill.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W53	Date of TSR release	13.1.2011	Time of TSR release	12pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area • Manage releases from Wivenhoe to maintain around 3500cumecs at Moggill	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over2,300,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Rainfall in the last 12 hours is generally below 5mm with isolated falls of up to 15mm in the Stanley, Lockyer and Pine River catchments. There is no significant rain expected fin the next 4 days.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 mAHD at 06:00 on 12 January 2011. Three sluices are opened as at 1300 12 January 2011 and discharging 1,250 m3/s into Wivenhoe Dam. Sluice gates will be utilised to drain of the flood storage compartment during the next 5 days. Water levels in Somerset Dam will fall slowly in the next 24 hours.

At 12pm Somerset was 103.96m and 642,535ML at 169.2%.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

The releases from Wivenhoe Dam had been temporarily reduced to 2,500 m3/s at 07:30 on Wednesday 12 January 2011 to allow the peak of Lockyer Creek to enter the Brisbane River. The Brisbane River has peaked at the Port Office Gauge early Thursday morning. Releases from Wivenhoe Dam will now be managed gradually from 1pm Thursday 13.1.2011 to achieve a target flow of around 3,500 m3/s at Moggill. This release will then be managed to drain the flood storage component within the required 7 days. This will not cause renewed rises downstream.

At 12pm Wivenhoe Dam was 74.61 m AHD at 2,170,100ML and 186.2% and dropping slowly.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

At 12pm North Pine Dam still gates open. North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At12pm North Pine Dam was 39.64mAHD and 215,179ML and 100.4% and slowly falling. It is expected that gates will be closed early Friday morning.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gates closed..

Hinze Dam:
A release of around 8,000megalitres a day is being made through the emergency gates. The Lake Level is dropping. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	13.1.2011	**Time**	5pm	**or Event**		

[redacted]

From: Rob Drury [redacted]
Sent: Thursday, 13 January 2011 3:59 PM
To: Rob Drury; Dan Spiller; Peter Borrows [redacted] Jim Pruss
Cc: [redacted]

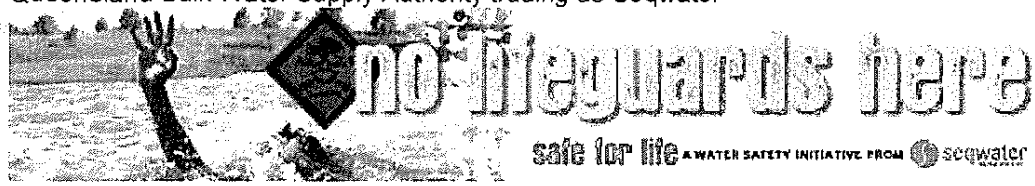
Subject: RE: Technical Report W53
Attachments: Technical_Situation_Report_W54.docx

Categories: T8

Attached is the latest report W53.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater





seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Thursday, 13 January 2011 1:09 PM
To: 'Dan Spiller'; Peter Borrows; [redacted]
Cc: [redacted]

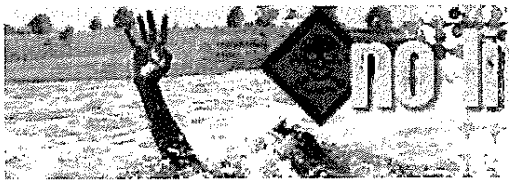
Subject: Technical Report W53

Attached is the latest report.

Releases from Somerset are being increased to drain Somerset into Wivenhoe Dam.
Releases from Wivenhoe will be managed from 1pm today to maintain a flow of around 3500cumecs at Moggill.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and
flowing water is FA
rethink

seqwater
WATER FOR LIFE

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W54	Date of TSR release	13.1.2011	Time of TSR release	3pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area • Manage releases from Wivenhoe to maintain around 3500cumecs at Moggill	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over2,300,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Rainfall in the last 12 hours is generally below 5mm with isolated falls of up to 15mm in the Stanley, Lockyer and Pine River catchments. There is no significant rain expected fin the next 4 days.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 mAHD at 06:00 on 12 January 2011. Three sluices are opened as at 1300 12 January 2011. Sluice gates will be utilised to drain of the flood storage compartment during the next 5 days. Water levels in Somerset Dam will fall slowly in the next 24 hours.

At 3pm Somerset was 103.86m and 636,100ML at 167.5% and discharging 1,389cumecs.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

The releases from Wivenhoe Dam had been temporarily reduced to 2,500 m3/s at 07:30 on Wednesday 12 January 2011 to allow the peak of Lockyer Creek to enter the Brisbane River. The Brisbane River has peaked at the Port Office Gauge early Thursday morning. Releases from Wivenhoe Dam will now be managed gradually from 1pm Thursday 13.1.2011 to achieve a target flow of around 3,500 m3/s at Moggill. This release will then be managed to drain the flood storage component within the required 7 days. This will not cause renewed rises downstream.

At 3pm Wivenhoe Dam was 74.57 m AHD at 2,163,861ML and 185.7% and dropping slowly and discharging 2,653cumecs.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At 3pm North Pine Dam was 39.63mAHD and 214,960ML and 100.3% and discharging 80cumecs. It is planned to close the gates at 5am Friday morning.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gates closed..

Hinze Dam:
A release of around 8,000megalitres a day is being made through the emergency gates. The Lake Level is dropping. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	13.1.2011	Time	8pm	or Event

Litsupport Brisbane

From: Dan Spiller
Sent: Thursday, 13 January 2011 4:55 PM
To: Barry Dennien
Subject: FW: Technical Report W53
Attachments: Technical_Situation_Report_W54.docx

From: Rob Drury [redacted]
Sent: Thursday, January 13, 2011 3:59 PM
To: Rob Drury; Dan Spiller; Peter Borrows; [redacted] Jim Pruss
Cc [redacted]
Subject: RE: Technical Report W53

Attached is the latest report W53.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

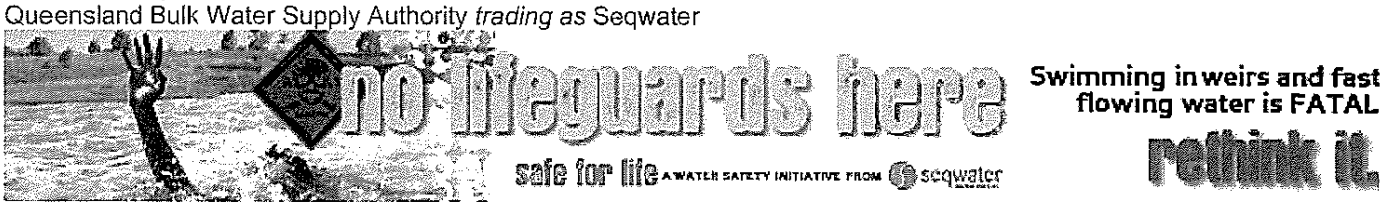
From: Rob Drury
Sent: Thursday, 13 January 2011 1:09 PM
To: 'Dan Spiller'; Peter Borrows; Paul Bird; [redacted]
Cc: [redacted]
Subject: Technical Report W53

Attached is the latest report.

Releases from Somerset are being increased to drain Somerset into Wivenhoe Dam.
Releases from Wivenhoe will be managed from 1pm today to maintain a flow of around 3500cumecs at Moggill.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W54	Date of TSR release	13.1.2011	Time of TSR release	3pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area • Manage releases from Wivenhoe to maintain around 3500cumecs at Moggill	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over2,300,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

Rainfall in the last 12 hours is generally below 5mm with isolated falls of up to 15mm in the Stanley, Lockyer and Pine River catchments. There is no significant rain expected fin the next 4 days.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 mAHD at 06:00 on 12 January 2011. Three sluices are opened as at 1300 12 January 2011. Sluice gates will be utilised to drain of the flood storage compartment during the next 5 days. Water levels in Somerset Dam will fall slowly in the next 24 hours.

At 3pm Somerset was 103.86m and 636,100ML at 167.5% and discharging 1,389cumecs.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

The releases from Wivenhoe Dam had been temporarily reduced to 2,500 m3/s at 07:30 on Wednesday 12 January 2011 to allow the peak of Lockyer Creek to enter the Brisbane River. The Brisbane River has peaked at the Port Office Gauge early Thursday morning. Releases from Wivenhoe Dam will now be managed gradually from 1pm Thursday 13.1.2011 to achieve a target flow of around 3,500 m3/s at Moggill. This release will then be managed to drain the flood storage component within the required 7 days. This will not cause renewed rises downstream.

At 3pm Wivenhoe Dam was 74.57 m AHD at 2,163,861ML and 185.7% and dropping slowly and discharging 2,653cumecs.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At 3pm North Pine Dam was 39.63mAHD and 214,960ML and 100.3% and discharging 80cumecs. It is planned to close the gates at 5am Friday morning.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gates closed..

Hinze Dam:
A release of around 8,000megalitres a day is being made through the emergency gates. The Lake Level is dropping. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	13.1.2011	Time	8pm	or Event		

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Thursday, 13 January 2011 8:49 PM
To: Rob Drury; Dan Spiller; Peter Borrows; [redacted] Jim Pruss
Cc: [redacted]
Subject: RE: Technical Report W55
Attachments: Technical_Situation_Report_W55.docx

Attached is Report W55.

North Pine will close at 5am tomorrow morning.
Wivenhoe is slowly adjusting as the Bremer and Lockyer die away, discharging around 3,117 cumecs at 8pm.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

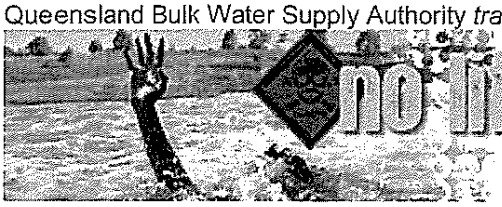
From: Rob Drury
Sent: Thursday, 13 January 2011 3:59 PM
To: Rob Drury; 'Dan Spiller'; Peter Borrows; [redacted] Jim Pruss
Cc: [redacted]
'Seqwater.comms@gmail.com'
Subject: RE: Technical Report W53

Attached is the latest report W53.

Rob

Robert Drury
Dam Operations Manager
Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.



[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

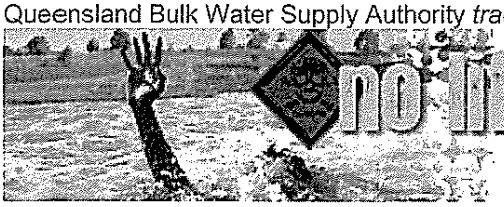
From: Rob Drury
Sent: Thursday, 13 January 2011 1:09 PM
To: 'Dan Spiller'; Peter Borrows; [redacted]
Cc: [redacted]
Subject: Technical Report W33

Attached is the latest report.

Releases from Somerset are being increased to drain Somerset into Wivenhoe Dam.
Releases from Wivenhoe will be managed from 1pm today to maintain a flow of around 3500cumecs at Moggill.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.



[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any

transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W55	Date of TSR release	13.1.2011	Time of TSR release	8pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area • Manage releases from Wivenhoe to maintain around 3500cumecs at Moggill	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over2,300,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

There has been no significant rainfall in the last 12 hours and none is expected for the next 5 days.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 mAHD at 06:00 on 12 January 2011. Three sluices are opened as at 1300 12 January 2011. Sluice gates will be utilised to drain of the flood storage compartment during the next 5 days. Water levels in Somerset Dam will fall slowly in the next 24 hours.

At 8pm Somerset was 103.47m and 611,359ML at 160.9% and discharging 1,268cumecs.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

The releases from Wivenhoe Dam are being managed to achieve a target flow of around 3,500 m3/s at Moggill. This release will then be maintained to drain the flood storage component within the required 7 days.

At 8pm Wivenhoe Dam was 74.46 m AHD at 2,146,663ML and 184.2% and dropping slowly and discharging 3,117cumecs.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At 8pm North Pine Dam was 39.56mAHD and 213,450ML and 99.6% and discharging.151cumecs. It is planned to close the gates at 5am Friday morning.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments and reviewing operating strategy every 30 minutes. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gates closed..

Hinze Dam:
A release of around 8,000megalitres a day is being made through the emergency gates. The Lake Level is dropping. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	14.1.2011	Time	8am	or Event	

[redacted]

From: Best Debbie [redacted]
Sent: Thursday, 13 January 2011 9:26 PM
To: Dan Spiller; [redacted]; [redacted]
Subject: RE: Hey, I need a number I can refer members of the public to who are ringing in to Premier's office with technical questions/criticisms about releases of water from Wivenhoe....

Categories: T8

Dan
David will organise and get back to you early in the day.
Debbie

From: Dan Spiller [redacted]
Sent: Thursday, 13 January 2011 8:42 PM
To: Best Debbie
Cc: Dennien Barry @ SEQWGM
Subject: FW: Hey, I need a number I can refer members of the public to who are ringing in to Premier's office with technical questions/criticisms about releases of water from Wivenhoe....

Debbie,

We can arrange call centre scripting about this. However, would DERM be able to take these calls?

Dan

From: [redacted]
Sent: Thursday, January 13, 2011 3:56 PM
To: Dan Spiller; [redacted]
Cc: Stephen Robertson
Subject: Fw: Hey, I need a number I can refer members of the public to who are ringing in to Premier's office with technical questions/criticisms about releases of water from Wivenhoe....

Dan, can u assist pls?

From [redacted]
To: [redacted]
Sent: Thu Jan 13 15:51:54 2011
Subject: Hey, I need a number I can refer members of the public to who are ringing in to Premier's office with technical questions/criticisms about releases of water from Wivenhoe....

[redacted]

The Hon Anna Bligh MP
Premier of Queensland

[redacted]

[redacted]

Please consider the environment before printing this email

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and /or publication of this email is also prohibited.

Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.

Please consider the environment before printing this email.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Friday, 14 January 2011 5:52 AM
To: Rob Drury; Dan Spiller; Peter Borrows; [redacted] Jim Pruss;
Cc: [redacted]
Subject: RE: Technical Report W55
Attachments: Technical_Situation_Report_W56.docx; Technical_Situation_Report_W56.doc

Attached report W56 in 2 formats.

North Pine closed at 5am.
Wivenhoe releasing close to 3500cumecs as the flows downstream are dropping off. Will continue around this rate until early next week to drain storage in 7 days.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au



Swimming in weirs and fast flowing water is FATAL
rethink it.

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W56	Date of TSR release	14.1.2011	Time of TSR release	5am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area and drain reservoir • Manage releases from Wivenhoe to maintain around 3500cumecs at Moggill	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over2,300,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

There has been no significant rainfall in the last 12 hours and falls of only 5mm is expected in the next twenty-four hours. Mostly fine conditions are expected over the weekend, but showers will return early next week.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 mAHD at 06:00 on 12 January 2011. Four sluices are opened. Sluice gates will be utilised to drain of the flood storage compartment during the next 4 days. Water levels in Somerset Dam will fall slowly in the next 24 hours.

At 5am Somerset was 102.87m and 574,852ML at 151.3% and discharging 1,300cumecs.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

The releases from Wivenhoe Dam are being managed to achieve a target flow of around 3,500 m3/s at Moggill. This release will then be maintained to drain the flood storage component within the required 7 days.

At 5am Wivenhoe Dam was 74.08 m AHD at 2,087,960ML and 179.22% and dropping slowly and discharging around 3,500cumecs and this flow will be maintained until early next week.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At 5am North Pine Dam was 39.4mAHD and 210,040ML and 98.0% and all gates were closed. The current level is expected to increase to just over 39.5 mAHD in the next few days due to base-flow. This could be higher if further rainfall occurs.
Fish recovery has commenced and MBRC have been advised that the gates have been closed. MBRC will inspect Youngs Crossing to determine if the crossing can be re-opened

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gates closed..

Hinze Dam:
A release of around 8,000megalitres a day is being made through the emergency gates. The Lake Level is dropping. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	14.1.2011	Time	8am	or Event		

TECHNICAL SITUATION REPORT

TSR Number	W56	Date of TSR release	14.1.2011	Time of TSR release	5am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area and drain reservoir • Manage releases from Wivenhoe to maintain around 3500cumecs at Moggill	
Key considerations	Storage levels:	Above FSL
	Inflows:	Inflows expected well over2,300,000ML.
	Rainfall:	Continuing
	Lockyer/Bremer:	Monitoring their inflows
	Brisbane River:	Impact as below.

Rainfall

There has been no significant rainfall in the last 12 hours and falls of only 5mm is expected in the next twenty-four hours. Mostly fine conditions are expected over the weekend, but showers will return early next week.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 mAHD at 06:00 on 12 January 2011. Four sluices are opened. Sluice gates will be utilised to drain of the flood storage compartment during the next 4 days. Water levels in Somerset Dam will fall slowly in the next 24 hours.

At 5am Somerset was 102.87m and 574,852ML at 151.3% and discharging 1,300cumecs.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

The releases from Wivenhoe Dam are being managed to achieve a target flow of around 3,500 m3/s at Moggill. This release will then be maintained to drain the flood storage component within the required 7 days.

At 5am Wivenhoe Dam was 74.08 m AHD at 2,087,960ML and 179.22% and dropping slowly and discharging around 3,500cumecs and this flow will be maintained until early next week.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At 5am North Pine Dam was 39.4mAHD and 210,040ML and 98.0% and all gates were closed. The current level is expected to increase to just over 39.5 mAHD in the next few days due to base-flow. This could be higher if further rainfall occurs.
Fish recovery has commenced and MBRC have been advised that the gates have been closed. MBRC will inspect Youngs Crossing to determine if the crossing can be re-opened

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels through the Brisbane and Pine catchments. The FOC is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gates closed..

Hinze Dam:
A release of around 8,000megalitres a day is being made through the emergency gates. The Lake Level is dropping. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	14.1.2011	Time	8am	or Event		

[redacted]

From: Best Debbie [redacted]
Sent: Friday, 14 January 2011 9:15 AM
To: Best Debbie; Dan Spiller; [redacted]
Cc: [redacted]
Subject: RE: Hey, I need a number I can refer members of the public to who are ringing in to Premier's office with technical questions/criticisms about releases of water from Wivenhoe....

Categories: T8

Dan

If you can arrange for call centre scripting to be sent to Debbie's email (plus [redacted] then we will have someone manning a phone.

Phone number is [redacted]

We should have someone on the end of that line within the hour if scripts are good to go. I will take any calls on that number in the meantime.

Thanks

[redacted]

From: Best Debbie
Sent: Thursday, 13 January 2011 9:26 PM
To: spiller daniel @ SEQWGM; [redacted] Reilly Bob
Subject: RE: Hey, I need a number I can refer members of the public to who are ringing in to Premier's office with technical questions/criticisms about releases of water from Wivenhoe....

Dan
David will organise and get back to you early in the day.
Debbie

From: Dan Spiller [redacted]
Sent: Thursday, 13 January 2011 8:42 PM
To: Best Debbie
Cc: Dennien Barry @ SEQWGM
Subject: FW: Hey, I need a number I can refer members of the public to who are ringing in to Premier's office with technical questions/criticisms about releases of water from Wivenhoe....

Debbie,

We can arrange call centre scripting about this. However, would DERM be able to take these calls?

Dan

From [redacted]
Sent: Thursday, January 13, 2011 3:56 PM
To: Dan Spiller; [redacted]
Cc: Stephen Robertson

Subject: Fw: Hey, I need a number I can refer members of the public to who are ringing in to Premier's office with technical questions/criticisms about releases of water from Wivenhoe....

Dan, can u assist pls?

Fro[redacted]
To: [redacted]
Sent: Thu Jan 13 15:51:54 2011
Subject: Hey, I need a number I can refer members of the public to who are ringing in to Premier's office with technical questions/criticisms about releases of water from Wivenhoe....

[redacted]

The Hon Anna Bligh MP
Premier of Queensland

[redacted]

[redacted]

Please consider the environment before printing this email

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and /or publication of this email is also prohibited.

Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.

Please consider the environment before printing this email.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

+--+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+--+

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Saturday, 15 January 2011 6:59 AM
To: Rob Drury; Dan Spiller; Peter Borrows; [redacted] Jim Pruss;
Cc: [redacted]
Subject: RE: Technical Report W57
Attachments: Technical_Situation_Report_W57.docx

Attached is report W57.
Only change is the gradual reduction in levels as below.
Will send next report tomorrow morning around 8am or so unless there is a significant change.

Main points

Rainfall There has been no significant rainfall in the last 24 hours and no significant rainfall is expected in the next twenty-four hours.

Somerset/Wivenhoe

Somerset is 101.35m and 490,137ML at 129.0% and discharging 920cumecs (release slowly decreases as the head of water behind sluices decreases.)

Wivenhoe Dam is 72.86 m AHD at 1,905,900ML and 163.6% and dropping slowly and discharging around 3,500cumecs and this flow will be maintained.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

At closure North Pine Dam was 39.4mAHD and 210,040ML and 98.0% and all gates were closed. The current level is expected to slightly increase to just over 39.5 mAHD in the next few days due to base-flow.

Leslie Harrison closed and Hinze to close gate around Tuesday.

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W57	Date of TSR release	15.1.2011	Time of TSR release	6am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area and drain reservoir • Manage releases from Wivenhoe to maintain around 3500cumecs at Moggill	
Key considerations	Storage levels:	Above FSL
	Inflows:	Total event inflows expected around 2,600,000ML.
	Rainfall:	Minimal
	Lockyer/Bremer:	Monitoring
	Brisbane River:	Impact as below.

Rainfall

There has been no significant rainfall in the last 24 hours and no significant rainfall is expected in the next twenty-four hours. Mostly fine conditions are expected over the weekend, but showers will return early next week.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 mAHD at 06:00 on 12 January 2011. Four sluices are opened. Sluice gates will be utilised to drain of the flood storage compartment during the next 4 days. Water levels in Somerset Dam will fall slowly in the next 24 hours.

At 6am Somerset was 101.35m and 490,137ML at 129.0% and discharging 920cumecs.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

The releases from Wivenhoe Dam are being managed to achieve a target flow of around 3,500 m3/s at Moggill. This release will then be maintained to drain the flood storage component by around Wednesday 19th January.

At 5am Wivenhoe Dam was 72.86 m AHD at 1,905,900ML and 163.6% and dropping slowly and discharging around 3,500cumecs and this flow will be maintained.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At closure North Pine Dam was 39.4mAHD and 210,040ML and 98.0% and all gates were closed. The current level is expected to increase to just over 39.5 mAHD in the next few days due to base-flow. This could be higher if further rainfall occurs.

MBRC will inspect Youngs Crossing to determine if the crossing can be re-opened

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels throughout the Brisbane and Pine River catchments and is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gates closed.

Hinze Dam:
A release of around 6,800megalitres a day is being made through the emergency gates. The Lake Level is dropping and the gate should be closed around Tuesday next week. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundotion areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	16.1.2011	Time	9am	or Event	

[redacted]

From: Dan Spiller
Sent: Saturday, 15 January 2011 8:50 AM
To: Barry Dennien
Subject: FW: Technical Report W57
Attachments: Technical_Situation_Report_W57.docx

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: T8

From: Rob Drury [redacted]
Sent: Saturday, January 15, 2011 6:59 AM
To: Rob Drury; Dan Spiller; Peter Borrows; [redacted] Jim Pruss; [redacted]
Subject: RE: Technical Report W57

Attached is report W57.
Only change is the gradual reduction in levels as below.
Will send next report tomorrow morning around 8am or so unless there is a significant change.

Main points

Rainfall There has been no significant rainfall in the last 24 hours and no significant rainfall is expected in the next twenty-four hours.

Somerset/Wivenhoe

Somerset is 101.35m and 490,137ML at 129.0% and discharging 920cumecs (release slowly decreases as the head of water behind sluices decreases.)

Wivenhoe Dam is 72.86 m AHD at 1,905,900ML and 163.6% and dropping slowly and discharging around 3,500cumecs and this flow will be maintained.

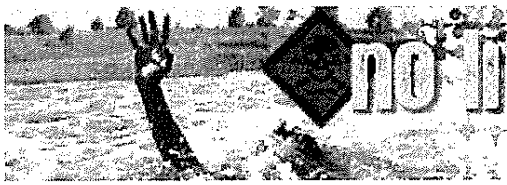
The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

At closure North Pine Dam was 39.4mAHD and 210,040ML and 98.0% and all gates were closed. The current level is expected to slightly increase to just over 39.5 mAHD in the next few days due to base-flow.

Leslie Harrison closed and Hinze to close gate around Tuesday.

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and f
flowing water is FAT

rethink

seqwater
WATER FOR LIFE

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W57	Date of TSR release	15.1.2011	Time of TSR release	6am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area and drain reservoir • Manage releases from Wivenhoe to maintain around 3500cumecs at Moggill	
Key considerations	Storage levels:	Above FSL
	Inflows:	Total event inflows expected around 2,600,000ML.
	Rainfall:	Minimal
	Lockyer/Bremer:	Monitoring
	Brisbane River:	Impact as below.

Rainfall

There has been no significant rainfall in the last 24 hours and no significant rainfall is expected in the next twenty-four hours. Mostly fine conditions are expected over the weekend, but showers will return early next week.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 mAHD at 06:00 on 12 January 2011. Four sluices are opened. Sluice gates will be utilised to drain of the flood storage compartment during the next 4 days. Water levels in Somerset Dam will fall slowly in the next 24 hours.

At 6am Somerset was 101.35m and 490,137ML at 129.0% and discharging 920cumecs.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

The releases from Wivenhoe Dam are being managed to achieve a target flow of around 3,500 m3/s at Moggill. This release will then be maintained to drain the flood storage component by around Wednesday 19th January.

At 5am Wivenhoe Dam was 72.86 m AHD at 1,905,900ML and 163.6% and dropping slowly and discharging around 3,500cumecs and this flow will be maintained.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At closure North Pine Dam was 39.4mAHD and 210,040ML and 98.0% and all gates were closed. The current level is expected to increase to just over 39.5 mAHD in the next few days due to base-flow. This could be higher if further rainfall occurs.

MBRC will inspect Youngs Crossing to determine if the crossing can be re-opened

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels throughout the Brisbane and Pine River catchments and is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gates closed.

Hinze Dam:
A release of around 6,800megalitres a day is being made through the emergency gates. The Lake Level is dropping and the gate should be closed around Tuesday next week. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	16.1.2011	**Time**	9am	**or Event**		

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Sunday, 16 January 2011 6:37 AM
To: Rob Drury; Dan Spiller; Peter Borrows; [redacted] Jim Pruss;
Cc: [redacted]
Subject: RE: Technical Report W58
Attachments: Technical_Situation_Report_W58.docx; Technical_Situation_Report_W58.doc

Attached is report W58 in 2 formats..
Only change is the gradual reduction in levels as below.
Will send next report tomorrow morning around 8am or so unless there is a significant change.

Main points

Rainfall There has been no significant rainfall in the last 24 hours and no significant rainfall is expected in the next twenty-four hours.

Somerset/Wivenhoe

At 6am Somerset was 100.01m and 424,360ML at 111.7% and discharging 820cumecs.

At 6am Wivenhoe Dam was 71.3 m AHD at 1,687,269ML and 144.8% and dropping and discharging around 3,477cumecs and this flow will be maintained.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

At 6am North Pine Dam was 39.46mAHD and 211,319ML and 98.6% and all gates were closed

Leslie Harrison closed and Hinze to close gate around Tuesday.

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W58	Date of TSR release	16.1.2011	Time of TSR release	6am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area and drain reservoir • Manage releases from Wivenhoe to maintain around 3500cumecs at Moggill	
Key considerations	Storage levels:	Above FSL
	Inflows:	Total event inflows expected around 2,600,000ML.
	Rainfall:	Minimal
	Lockyer/Bremer:	Monitoring
	Brisbane River:	Impact as below.

Rainfall

There has been no significant rainfall in the last 24 hours and no significant rainfall is expected in the next twenty-four hours. Mostly fine conditions are expected over the weekend, but showers will return early next week.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 mAHD at 06:00 on 12 January 2011. Four sluices are opened. Sluice gates will be utilised to drain of the flood storage compartment during the next 4 days. Water levels in Somerset Dam will fall slowly in the next 24 hours.

At 6am Somerset was 100.01m and 424,360ML at 111.7% and discharging 820cumecs.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

The releases from Wivenhoe Dam are being managed to achieve a target flow of around 3,500 m3/s at Moggill. This release will then be maintained to drain the flood storage component by around Wednesday 19th January.

At 6am Wivenhoe Dam was 71.3 m AHD at 1,687,269ML and 144.8% and dropping slowly and discharging around 3,477cumecs and this flow will be maintained.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At 6am North Pine Dam was 39.46mAHD and 211,319ML and 98.6% and all gates were closed. The current level is expected to increase to just over 39.5 mAHD in the next few days due to base-flow. This could be higher if further rainfall occurs.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels throughout the Brisbane and Pine River catchments and is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gates closed.

Hinze Dam:
A release of around 6,800megalitres a day is being made through the emergency gates. The Lake Level is dropping and the gate should be closed around Tuesday next week. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Worning for the BrisbaneRiver and other relevont Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	17.1.2011	Time	9am	or Event		

TECHNICAL SITUATION REPORT

TSR Number	W58	Date of TSR release	16.1.2011	Time of TSR release	6am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Continue release of water from Somerset into Wivenhoe to reduce impacts upstream in Kilcoy area and drain reservoir • Manage releases from Wivenhoe to maintain around 3500cumecs at Moggill	
Key considerations	Storage levels:	Above FSL
	Inflows:	Total event inflows expected around 2,600,000ML.
	Rainfall:	Minimal
	Lockyer/Bremer:	Monitoring
	Brisbane River:	Impact as below.

Rainfall

There has been no significant rainfall in the last 24 hours and no significant rainfall is expected in the next twenty-four hours. Mostly fine conditions are expected over the weekend, but showers will return early next week.

Somerset/Wivenhoe

Somerset Dam has peaked at 105.11 mAHD at 06:00 on 12 January 2011. Four sluices are opened. Sluice gates will be utilised to drain of the flood storage compartment during the next 4 days. Water levels in Somerset Dam will fall slowly in the next 24 hours.

At 6am Somerset was 100.01m and 424,360ML at 111.7% and discharging 820cumecs.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

The releases from Wivenhoe Dam are being managed to achieve a target flow of around 3,500 m3/s at Moggill. This release will then be maintained to drain the flood storage component by around Wednesday 19th January.

At 6am Wivenhoe Dam was 71.3 m AHD at 1,687,269ML and 144.8% and dropping slowly and discharging around 3,477cumecs and this flow will be maintained.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At 6am North Pine Dam was 39.46mAHD and 211,319ML and 98.6% and all gates were closed. The current level is expected to increase to just over 39.5 mAHD in the next few days due to base-flow. This could be higher if further rainfall occurs.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels throughout the Brisbane and Pine River catchments and is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gates closed.

Hinze Dam:
A release of around 6,800megalitres a day is being made through the emergency gates. The Lake Level is dropping and the gate should be closed around Tuesday next week. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	17.1.2011	Time	9am	or Event	

[redacted]

From: Barry Dennien
Sent: Sunday, 16 January 2011 7:25 AM
To: Dan Spiller; Bradley John
Subject: Fwd: Should the Wivenhoe have been bigger? | Courier Mail Andrew Bolt Blog

Categories: T8

For note

Regards
Barry Dennien

Begin forwarded message:

> **From:** Barry Dennien [redacted]
> **Date:** 16 January 2011 7:00:05 AM AEST
> **To:** Peter Borrows [redacted]
> **Subject: Should the Wivenhoe have been bigger? | Courier Mail Andrew Bolt Blog**
>
> http://blogs.news.com.au/couriermail/andrewbolt/index.php/couriermail/comments/should_the_wivenhoe_have_been_bigger/
>
> Peter
>
> It may be worthwhile starting to gather all dam studies and reports
>
> Note this blog is selectively picking bits of information from the 2007 report
>
> Talk later
>
> Barry

Regards
Barry Dennien

Litsupport Brisbane

From: Dan Spiller
Sent: Sunday, 16 January 2011 1:29 PM
To: mfoste[redacted]
Subject: FW: Information

From: Dan Spiller
Sent: Sunday, January 16, 2011 11:00 AM
To: 'Peter Borrows'
Cc: Barry Dennien
Subject: Information

Peter,

Apologies for the interruption - I am in the Brisbane LDMG and they got to the water section. I will call again when I get out.

As discussed, ny view is that TSR from the morning of 8/1 is critical. The rainfall forecasts at that time were as follows:

Rainfall

Since 0900 Fridoy, there has been widespread 20 to 40mm throughout North Pine, Somerset and Wivenhoe cotchments with isolated higher totals af 70mm in the upper reoches of the Brisbane R. No significant rain has fallen in the past 12 hours.

Advice from BaM indicates that SE Qld can expect further high rainfall totals over the next 4 days.

Saturday: *Rain light at times 5-50mm with higher falls along the coast*
Sundoy: *Widespread rain with totals between 50-100mm*
Monday: *Widespread rain again with totols between 50-100mm*
Tuesday: *Roin easing with totals between 25-50mm*

Given the saturated conditions of the catchments, significant inflows to Seqwater dams will be generated, especially following the forecast rainfall on Sunday/Monday

My understanding from the subsequent TSRs is that the forecasts for Saturday and Tuesday were accurate, but that total rainfall over the four days was higher than was forecast and, in particular, the rainfall on Sunday and Monday was much higher.

In terms of communications materials, I think it would be telling to have a graph illustrating forecast rainfall in the dam catchments as at the morning of 8/1 against actual rainfall. We are happy to finesse this, if we can get the data from your team (potentially via BoM).

Separately, we will obviously need a chart building up river levels over the week from 8/1. This would include tide, atmospheric anomalies, local flows, Lockyer and Bremer flows and dam releases. I imagine your team is already working on this. It may or may not be useful for communications.

Regards,
Dan

Litsupport Brisbane

From: Peter Borrows[redacted]
Sent: Sunday, 16 January 2011 2:26 PM
To: Dan Spiller; Rob Drury
Cc: Peter Borrows
Subject: RE: Data

Hi Dan.

The first point is in the Manual of Operational Procedures for Flood mitigation at Wivenhoe Dam and Somerset Dam – Appendix C. Assume you have this?

The other 2 questions need to be part of information post the event. We need to get information and agree it with the BOM. History has shown any variations to this sort of information gives more grief later.

Regards, Peter.

Peter Borrows
Chief Executive Officer
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au



From: Dan Spiller[redacted]
Sent: Sunday, 16 January 2011 1:02 PM
To: Peter Borrows; Rob Drury
Subject: Data

Peter and Rob,

A couple of other things would be useful for our communications material:

- a dam storage curve with heights and volumes
- the data table from the flood volumes and hydrographs table
- a data table for dam levels for the same period.

We will check with you before using anything externally.

Thanks,
Dan

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

----------Safe Stamp----------

Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

From: [redacted]
Sent: Sunday, January 16, 2011 2:45 PM
To: Bradley John [redacted] Dan Spiller [redacted]; Barry Dennien [redacted] Hunt Dan [redacted]
Cc: [redacted]
Subject: Special cabinet Meeting - Monday 17 January 2010 - Pre Brief

Confidential

John,Dan('s) ,Barry

I confirm a pre-cabinet briefing tomorrow morning from 9am in Minister Robertson's boardroom.

Thanks

[redacted]

This email, together with any attachments, is intended for the named recipient(s) only; and may contain ptivileged and confidential inf
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that telies on it; any form of disclosu
Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Govetnment.
Please consider the environment before printing this email.

[redacted]

From: Dan Spiller
Sent: Sunday, 16 January 2011 5:54 PM
To: [redacted]
Subject: FW: Information

Categories: T8

From: Dan Spiller
Sent: Sunday, January 16, 2011 11:00 AM
To: 'Peter Borrows'
Cc: Barry Dennien
Subject: Information

Peter,

Apologies for the interruption - I am in the Brisbane LDMG and they got to the water section. I will call again when I get out.

As discussed, ny view is that TSR from the morning of 8/1 is critical. The rainfall forecasts at that time were as follows:

Rainfall

Since 0900 Friday, there has been widespread 20 to 40mm throughout North Pine, Somerset and Wivenhae catchments with isolated higher totals of 70mm in the upper reaches of the Brisbane R. No significant rain has fallen in the post 12 hours.

Advice from BoM indicates that SE Qld can expect further high rainfall totals over the next 4 days.

Saturday: Rain light at times 5-50mm with higher falls along the caast
Sunday: Widespread rain with tatals between 50-100mm
Monday: Widespread rain again with tatals between 50-100mm
Tuesdoy: Rain easing with totals between 25-50mm

Given the saturated conditions of the catchments, significant inflows to Seqwater dams will be generated, especially following the forecast rainfall on Sunday/Manday

My understanding from the subsequent TSRs is that the forecasts for Saturday and Tuesday were accurate, but that total rainfall over the four days was higher than was forecast and, in particular, the rainfall on Sunday and Monday was much higher.

In terms of communications materials, I think it would be telling to have a graph illustrating forecast rainfall in the dam catchments as at the morning of 8/1 against actual rainfall. We are happy to finesse this, if we can get the data from your team (potentially via BoM).

Separately, we will obviously need a chart building up river levels over the week from 8/1. This would include tide, atmospheric anomalies, local flows, Lockyer and Bremer flows and dam releases. I imagine your team is already working on this. It may or may not be useful for communications.

Regards,
Dan

[redacted]

From: WaterGridMedia [redacted]
Sent: Sunday, 16 January 2011 6:19 PM
To: [redacted]
Cc: Dan Spiller; [redacted]
Subject: further questions from Hedley Thomas- The Australian

Categories: T8

HI [redacted]

Further to the conversation with Dan approximately an hour ago,

Please find below further questions from Hedley Thomas. We are currently drafting a response and will need a fast turnaround please. Will send through the response shortly.

Regards
Water Grid Communications Unit

From: Thomas, Hedley [redacted]
Sent: Sunday, 16 January 2011 5:13 PM
To: WaterGridMedia
Subject: RE: Floods- Wivenhoe The Australian 140111 (4).doc

[redacted]

The deadline has to be 6.30pm your time because we are an hour ahead in Sydney. That's why it was missed last time, and it is why I again asked two hours ago for an oral briefing. I cannot do anything if the deadline is missed.

I am focusing on a story around the relatively limited releases of water on Friday, Saturday and Sunday (Jan 7-9) when the dam's capacity went from a little over 100 per cent to almost 150 per cent.

1. Why did SEQWater permit the flood storage capacity to build up so much over the weekend?

2. Why did SEQWater not release significantly greater volumes on Friday, Saturday and Sunday, prior to the freak rainfall event on Monday over the Toowoomba escarpment?

3. What does SEQWater say to the suggestion that its strategy to limit the releases on the weekend meant its storage buffer was limited, necessitating a massive outflow on Tuesday of 645,000 megalitires?

4. What does SEQWater say to the suggestion that this 645,000 megalitre release was responsible for more than 80 per cent of the peak flow rate (which you advised me last Friday was about 9000 cubic metres per second in Brisbane)?

5. What does SEQWater say to the suggestion that its delay in responding to the increasing water levels at Wivenhoe forced its management to take rash action on Tuesday, which produced the flood in Brisbane?

My mobileis [redacted]

Cheers
Hedley Thomas

From: WaterGridMedi [redacted]
Sent: Sun 16/01/2011 5:10 PM

To: Thomas, Hedley
Subject: RE: Floods- Wivenhoe The Australian 140111 (4).doc

Dear Hedley

[redacted] will not be able to speak to you directly over the phone today, if you could please send in your questions to watergridmedia@linkwater.com.au we will endeavour to get you a response asap.

Kindest Regards

[redacted]
Water Grid Communications Team

[redacted]

www.watergrid.com.au

From: Thomas, Hedley [redacted]
Sent: Friday, 14 January 2011 8:19 PM
To: WaterGridMedia
Subject: RE: Floods- Wivenhoe The Australian 140111 (4).doc

Thanks, we missed the deadline for the first edition by a wide mark but I have managed to force some of the statement into the articles for the second edition, and I have asked them to make sure the internet version picks up the comment.

Cheers

Hedley Thomas
National Chief Correspondent
The Australian & The Weekend Australian

[redacted]

28 Mayne Road Bowen Hills Qld 4006

From: WaterGridMedia [redacted]
Sent: Friday, 14 January 2011 8:45 PM
To: Thomas, Hedley
Subject: Floods- Wivenhoe The Australian 140111 (4).doc

Hedley as promised, responses.

Thanks,

SEQ WGM Media Unit.

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

This message and its attachments may contain legally privileged or confidential information. It is intended solely for the named addressee. If you are not the addressee indicated in this message or responsible for delivery of the message to the addressee, you may not copy or deliver this message or its attachments to anyone. Rather, you should permanently delete this message and its attachments and kindly notify the sender by reply e-mail. Any content of this message and its attachments which does not relate to the official business of the sending company must be taken not to have been sent or endorsed by that company or any of its related entities. No warranty is made that the e-mail or attachments are free from computer virus or other defect.

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

[redacted]

From: Dan Spiller
Sent: Sunday, 16 January 2011 6:50 PM
To: 'Bradley John'; [redacted]
Subject: Media Response - the Australian - Hedley 16 1 11
Attachments: Media Response - the Australian - Hedley 16 1 11.doc

Categories: T8

SEQ Water Grid

Media Response

Request – Hedley Thomas
Position - National Chief Correspondent
Media outlet - The Australian & The Weekend Australian
[redacted]

I am focusing on a story around the relatively limited releases of water on Friday, Saturday and Sunday (Jan 7-9) when the dam's capacity went from a little over 100 per cent to almost 150 per cent.

1. **Why did Seqwater permit the flood storage capacity to build up so much over the weekend?**

Releases were made based on the approved Operational Procedures and rainfall forecasts provided by the Bureau of Meteorology.

Based on the forecasts provided to us, higher release rates were not required. For example, the forecasts provided to us on the morning of Saturday 8 January 2011 were:

Saturday:	Rain light at times 5-50mm with higher falls along the coast
Sunday:	Widespread rain with totals between 50-100mm
Monday:	Widespread rain again with totals between 50-100mm
Tuesday:	Rain easing with totals between 25-50mm.

The dam has managed events of this type on multiple occasions without flooding houses.

Unfortunately, the rainfall that occurred during this event was greater than anticipated - both over the event as a whole and from day to day. Actual rainfall on each of these days was significantly higher, with daily rainfall of up to 300 mm in some areas.

From late Sunday, combined flows at Moggill were about 4000 cubic metres per second, including dam releases and other flows. This is the limit above which houses begin to be flooded.

There was no reason to cause inundation of houses at that time, based on the forecasts that continued to be provided over the weekend.

2. **Why did Seqwater not release significantly greater volumes on Friday, Saturday and Sunday, prior to the freak rainfall event on Monday over the Toowoomba escarpment?**

Releases were based on rainfall forecasts provided by the Bureau of Meteorology. Actual rainfall exceeded the forecasts for both the weekend or in the following days. The rainfall event on Monday over the Toowoomba escarpment is one example of this. The persistence and intensity of the rainfall on 11 January 2011 was also unanticipated, as has been stated by the Bureau of Meteorology.

3. **What does Seqwater say to the suggestion that its strategy to limit the releases on the weekend meant its storage buffer was limited, necessitating a massive outflow on Tuesday of 645,000 megalitres?**

See above.

4. **What does Seqwater say to the suggestion that this 645,000 megalit release was responsible for more than 80 per cent of the peak flow rate (which you advised me last Friday was about 9000 cubic metres per second in Brisbane)?**

See above.

5. **What does Seqwater say to the suggestion that its delay in responding to the increasing water levels at Wivenhoe forced its management to take rash action on Tuesday, which produced the flood in Brisbane?**

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

[redacted]

[redacted]

From: Dan Spiller
Sent: Sunday, 16 January 2011 6:54 PM
To: 'Peter Borrows'
Subject: Media Response - the Australian - Hedley 16 1 11
Attachments: Media Response - the Australian - Hedley 16 1 11.doc

Categories: T8

Peter,

Draft responses for your urgent review.

Dan and Barry

SEQ Water Grid

Media Response

Request – Hedley Thomas
Position - National Chief Correspondent
Media outlet - The Australian & The Weekend Australian
[redacted]

I am focusing on a story around the relatively limited releases of water on Friday, Saturday and Sunday (Jan 7-9) when the dam's capacity went from a little over 100 per cent to almost 150 per cent.

1. **Why did Seqwater permit the flood storage capacity to build up so much over the weekend?**

Releases were made based on the approved Operational Procedures and rainfall forecasts provided by the Bureau of Meteorology.

Based on the forecasts provided to us, higher release rates were not required. For example, the forecasts provided to us on the morning of Saturday 8 January 2011 were:

Saturday:	Rain light at times 5-50mm with higher falls along the coast
Sunday:	Widespread rain with totals between 50-100mm
Monday:	Widespread rain again with totals between 50-100mm
Tuesday:	Rain easing with totals between 25-50mm.

The dam has managed events of this type on multiple occasions without flooding houses.

Unfortunately, the rainfall that occurred during this event was greater than anticipated - both over the event as a whole and from day to day. Actual rainfall on each of these days was significantly higher, with daily rainfall of up to 300 mm in some areas.

From late Sunday, combined flows at Moggill were about 4000 cubic metres per second, including dam releases and other flows. This is the limit above which houses begin to be flooded.

There was no reason to cause inundation of houses at that time, based on the forecasts that continued to be provided over the weekend.

2. **Why did Seqwater not release significantly greater volumes on Friday, Saturday and Sunday, prior to the freak rainfall event on Monday over the Toowoomba escarpment?**

Releases were based on rainfall forecasts provided by the Bureau of Meteorology. Actual rainfall exceeded the forecasts for both the weekend or in the following days. The rainfall event on Monday over the Toowoomba escarpment is one example of this. The persistence and intensity of the rainfall on 11 January 2011 was also unanticipated, as has been stated by the Bureau of Meteorology.

3. **What does Seqwater say to the suggestion that its strategy to limit the releases on the weekend meant its storage buffer was limited, necessitating a massive outflow on Tuesday of 645,000 megalitres?**

See above.

4. **What does Seqwater say to the suggestion that this 645,000 megalit release was responsible for more than 80 per cent of the peak flow rate (which you advised me last Friday was about 9000 cubic metres per second in Brisbane)?**

The peak release was sustained for a very period. Their impact was reduced reducing releases as soon as rainfall eased.

5. **What does Seqwater say to the suggestion that its delay in responding to the increasing water levels at Wivenhoe forced its management to take rash action on Tuesday, which produced the flood in Brisbane?**

See above.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

[redacted]

[redacted]

From: Dan Spiller
Sent: Sunday, 16 January 2011 7:07 PM
To: 'Peter Borrows'
Subject: Media Response - the Australian - Hedley 16 1 11
Attachments: Media Response - the Australian - Hedley 16 1 11.doc

Categories: T8

Revised version.

SEQ Water Grid

Media Response

Request – Hedley Thomas
Position - National Chief Correspondent
Media outlet - The Australian & The Weekend Australian

[redacted]

I am focusing on a story around the relatively limited releases of water on Friday, Saturday and Sunday (Jan 7-9) when the dam's capacity went from a little over 100 per cent to almost 150 per cent.

1. **Why did Seqwater permit the flood storage capacity to build up so much over the weekend?**

Releases were made based on the approved Operational Procedures and rainfall forecasts provided by the Bureau of Meteorology.

Under the Operational Procedures, flood releases take into account flows from the Lockyer and Bremer. Significant rainfall occurred over the weekend in these areas, with the dam holding back floodwater from the upper Brisbane River in order to minimise the impacts on downstream areas.

This was considered to be the most appropriate balance, based on the rainfall forecasts provided to us. For example, the forecasts provided to us on the morning of Saturday 8 January 2011 were:

Saturday:	Rain light at times 5-50mm with higher falls along the coast
Sunday:	Widespread rain with totals between 50-100mm
Monday:	Widespread rain again with totals between 50-100mm
Tuesday:	Rain easing with totals between 25-50mm.

The dam has managed events of this type on multiple occasions without flooding houses.

2. **Why did Seqwater not release significantly greater volumes on Friday, Saturday and Sunday, prior to the freak rainfall event on Monday over the Toowoomba escarpment?**

Releases were based on rainfall forecasts provided by the Bureau of Meteorology. Actual rainfall exceeded the forecasts for both the weekend and the following days. The rainfall event on Monday over the Toowoomba escarpment is one example of this. The persistence and intensity of the rainfall on 11 January 2011 was also unanticipated, as has been stated by the Bureau of Meteorology.

3. **What does Seqwater say to the suggestion that its strategy to limit the releases on the weekend meant its storage buffer was limited, necessitating a massive outflow on Tuesday of 645,000 megalitres?**

See above.

4. **What does Seqwater say to the suggestion that this 645,000 megalit release was responsible for more than 80 per cent of the peak flow rate (which you advised me last Friday was about 9000 cubic metres per second in Brisbane)?**

The peak release was sustained for a very period. Their impact was reduced reducing releases as soon as rainfall eased.

5. **What does Seqwater say to the suggestion that its delay in responding to the increasing water levels at Wivenhoe forced its management to take rash action on Tuesday, which produced the flood in Brisbane?**

See above.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

[redacted]

[redacted]

From: Dan Spiller
Sent: Sunday, 16 January 2011 7:25 PM
To: [redacted]
Cc: 'Bradley John'
Subject: Media Response - the Australian - Hedley 16 1 11
Attachments: Media Response - the Australian - Hedley 16 1 11.doc

Categories: T8

Lauren,

With question four updated.

Dan

SEQ Water Grid

Media Response

Request – Hedley Thomas
Position - National Chief Correspondent
Media outlet - The Australian & The Weekend Australian

[redacted]

I am focusing on a story around the relatively limited releases of water on Friday, Saturday and Sunday (Jan 7-9) when the dam's capacity went from a little over 100 per cent to almost 150 per cent.

1. **Why did Seqwater permit the flood storage capacity to build up so much over the weekend?**

Releases were made based on the approved Operational Procedures and rainfall forecasts provided by the Bureau of Meteorology.

Under the Operational Procedures, flood releases take into account flows from the Lockyer and Bremer. Significant rainfall occurred over the weekend in these areas, with the dam holding back floodwater from the upper Brisbane River in order to minimise the impacts on downstream areas.

This was considered to be the most appropriate balance, based on the rainfall forecasts provided to us. For example, the forecasts provided to us on the morning of Saturday 8 January 2011 were:

Saturday:	Rain light at times 5-50mm with higher falls along the coast
Sunday:	Widespread rain with totals between 50-100mm
Monday:	Widespread rain again with totals between 50-100mm
Tuesday:	Rain easing with totals between 25-50mm.

The dam has managed events of this type on multiple occasions without flooding houses.

2. **Why did Seqwater not release significantly greater volumes on Friday, Saturday and Sunday, prior to the freak rainfall event on Monday over the Toowoomba escarpment?**

Releases were based on rainfall forecasts provided by the Bureau of Meteorology. Actual rainfall exceeded the forecasts for both the weekend and the following days. The rainfall event on Monday over the Toowoomba escarpment is one example of this. The persistence and intensity of the rainfall on 11 January 2011 was also unanticipated, as has been stated by the Bureau of Meteorology.

3. **What does Seqwater say to the suggestion that its strategy to limit the releases on the weekend meant its storage buffer was limited, necessitating a massive outflow on Tuesday of 645,000 megalitres?**

See above.

4. **What does Seqwater say to the suggestion that this 645,000 megalit release was responsible for more than 80 per cent of the peak flow rate (which you advised me last Friday was about 9000 cubic metres per second in Brisbane)?**

The peak release rate was sustained for only three hours. The releases were reduced from about 645,000 megalitres per day to 216,000 megalitres per day as soon as rainfall eased. This prompt response minimised the impact of the peak release rate on river levels in Brisbane City.

5. **What does Seqwater say to the suggestion that its delay in responding to the increasing water levels at Wivenhoe forced its management to take rash action on Tuesday, which produced the flood in Brisbane?**

Releases were made based on the approved Operational Procedures and rainfall forecasts provided by the Bureau of Meteorology. Increasing releases earlier may have resulted in houses being flooded unnecessary.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

[redacted]

[redacted]

From: Dan Spiller
Sent: Sunday, 16 January 2011 7:26 PM
To: 'Peter Borrows'
Subject: Media Response - the Australian - Hedley 16 1 11
Attachments: Media Response - the Australian - Hedley 16 1 11.doc

Categories: T8

Peter,

Some refinements to questions four and five.

Dan

SEQ Water Grid

Media Response

Request – Hedley Thomas
Position - National Chief Correspondent
Media outlet - The Australian & The Weekend Australian
[redacted]

I am focusing on a story around the relatively limited releases of water on Friday, Saturday and Sunday (Jan 7-9) when the dam's capacity went from a little over 100 per cent to almost 150 per cent.

1. **Why did Seqwater permit the flood storage capacity to build up so much over the weekend?**

Releases were made based on the approved Operational Procedures and rainfall forecasts provided by the Bureau of Meteorology.

Under the Operational Procedures, flood releases take into account flows from the Lockyer and Bremer. Significant rainfall occurred over the weekend in these areas, with the dam holding back floodwater from the upper Brisbane River in order to minimise the impacts on downstream areas.

This was considered to be the most appropriate balance, based on the rainfall forecasts provided to us. For example, the forecasts provided to us on the morning of Saturday 8 January 2011 were:

Saturday:	Rain light at times 5-50mm with higher falls along the coast
Sunday:	Widespread rain with totals between 50-100mm
Monday:	Widespread rain again with totals between 50-100mm
Tuesday:	Rain easing with totals between 25-50mm.

The dam has managed events of this type on multiple occasions without flooding houses.

2. **Why did Seqwater not release significantly greater volumes on Friday, Saturday and Sunday, prior to the freak rainfall event on Monday over the Toowoomba escarpment?**

Releases were based on rainfall forecasts provided by the Bureau of Meteorology. Actual rainfall exceeded the forecasts for both the weekend and the following days. The rainfall event on Monday over the Toowoomba escarpment is one example of this. The persistence and intensity of the rainfall on 11 January 2011 was also unanticipated, as has been stated by the Bureau of Meteorology.

3. **What does Seqwater say to the suggestion that its strategy to limit the releases on the weekend meant its storage buffer was limited, necessitating a massive outflow on Tuesday of 645,000 megalitres?**

See above.

4. **What does Seqwater say to the suggestion that this 645,000 megalit release was responsible for more than 80 per cent of the peak flow rate (which you advised me last Friday was about 9000 cubic metres per second in Brisbane)?**

The peak release rate was sustained for only three hours. The releases were reduced from about 645,000 megalitres per day to 216,000 megalitres per day as soon as rainfall eased. This prompt response minimised the impact of the peak release rate on river levels in Brisbane City.

5. **What does Seqwater say to the suggestion that its delay in responding to the increasing water levels at Wivenhoe forced its management to take rash action on Tuesday, which produced the flood in Brisbane?**

Releases were made based on the approved Operational Procedures and rainfall forecasts provided by the Bureau of Meteorology. Increasing releases earlier may have resulted in houses being flooded unnecessary.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

[redacted]

[redacted]

From: Dan Spiller
Sent: Sunday, 16 January 2011 7:23 PM
To: 'Bradley John'
Subject: Media Response - the Australian - Hedley 16 1 11
Attachments: Media Response - the Australian - Hedley 16 1 11.doc

Categories: T8

SEQ Water Grid

Media Response

Request – Hedley Thomas
Position - National Chief Correspondent
Media outlet - The Australian & The Weekend Australian

[redacted]

I am focusing on a story around the relatively limited releases of water on Friday, Saturday and Sunday (Jan 7-9) when the dam's capacity went from a little over 100 per cent to almost 150 per cent.

1. **Why did Seqwater permit the flood storage capacity to build up so much over the weekend?**

Releases were made based on the approved Operational Procedures and rainfall forecasts provided by the Bureau of Meteorology.

Under the Operational Procedures, flood releases take into account flows from the Lockyer and Bremer. Significant rainfall occurred over the weekend in these areas, with the dam holding back floodwater from the upper Brisbane River in order to minimise the impacts on downstream areas.

This was considered to be the most appropriate balance, based on the rainfall forecasts provided to us. For example, the forecasts provided to us on the morning of Saturday 8 January 2011 were:

Saturday:	Rain light at times 5-50mm with higher falls along the coast
Sunday:	Widespread rain with totals between 50-100mm
Monday:	Widespread rain again with totals between 50-100mm
Tuesday:	Rain easing with totals between 25-50mm.

The dam has managed events of this type on multiple occasions without flooding houses.

2. **Why did Seqwater not release significantly greater volumes on Friday, Saturday and Sunday, prior to the freak rainfall event on Monday over the Toowoomba escarpment?**

Releases were based on rainfall forecasts provided by the Bureau of Meteorology. Actual rainfall exceeded the forecasts for both the weekend and the following days. The rainfall event on Monday over the Toowoomba escarpment is one example of this. The persistence and intensity of the rainfall on 11 January 2011 was also unanticipated, as has been stated by the Bureau of Meteorology.

3. **What does Seqwater say to the suggestion that its strategy to limit the releases on the weekend meant its storage buffer was limited, necessitating a massive outflow on Tuesday of 645,000 megalitres?**

See above.

4. **What does Seqwater say to the suggestion that this 645,000 megalit release was responsible for more than 80 per cent of the peak flow rate (which you advised me last Friday was about 9000 cubic metres per second in Brisbane)?**

The peak release rate was sustained for only three hours. The rate was reduced as soon as rainfall eased, minimising the impact of the peak release rate on river levels in Brisbane City.

5. **What does Seqwater say to the suggestion that its delay in responding to the increasing water levels at Wivenhoe forced its management to take rash action on Tuesday, which produced the flood in Brisbane?**

Releases were made based on the approved Operational Procedures and rainfall forecasts provided by the Bureau of Meteorology. Increasing releases earlier may have resulted in houses being flooded unnecessary.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

[redacted]

From: [redacted]
Sent: Sunday, January 16, 2011 7:40 PM
To: Dan Spiller [redacted]
Cc: NRMET Advisors [redacted]
Subject: FW: Media Response - the Australian - Hedley 16 1 11

OK to go.

Thanks,

[redacted]
Assistant Media Advisor
Office of the Hon. Stephen Robertson MP
Minister for Natural Resources, Mines and Energy and Minister for Trade
[redacted]

From [redacted]
Sent: Sunday, 16 January 2011 7:37 PM
To: [redacted]; Premiers Office - Media Unit
Cc: NRMET Advisors
Subject: Re: Media Response - the Australian - Hedley 16 1 11

Ok, thanks.

From: [redacted]
To [redacted] Premiers Office - Media Unit
Cc: NRMET Advisors
Sent: Sun Jan 16 19:27:36 2011
Subject: FW: Media Response - the Australian - Hedley 16 1 11
[redacted]

Updated response to Q 4 attached.

Please let me know what you think.

[redacted]
Assistant Media Advisor
Office of the Hon. Stephen Robertson MP
Minister for Natural Resources, Mines and Energy and Minister for Trade
[redacted]

From: Dan Spiller [redacted]
S [redacted] January 2011 7:25 PM
T
Cc: 'Bradley John'
Subject: Media Response - the Australian - Hedley 16 1 11

[redacted]

With question four updated.

Dan

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential inf

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosu

Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.

Please consider the environment before printing this email.

[redacted]

From: WaterGridMedia [redacted]
Sent: Monday, 17 January 2011 6:22 AM
To: [redacted]; Dan Spiller
Subject: RE: Media Release Request RE Wivenhoe

Categories: T8

Hi [redacted]

We will put something together now.

Regards
[redacted]

-----O[redacted]---
From: [redacted]
Sent: Monday, 17 January 2011 5:55 AM
To: WaterGridMedia; dan.spille[redacted]
Subject: Media Release Request RE Wivenhoe

Hi team,

We're hoping to get a MR out this morning on the handling of Wivenhoe.

I was hoping you could draft something for me ASAP?

Thank you,

[redacted]

Assistant Media Advisor
Office of the Hon. Stephen Robertson MP
Minister for Natural Resources, Mines and Energy and Minister for Trade
[redacted]

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and /or publication of this email is also prohibited.

Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.

Please consider the environment before printing this email.

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly

prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

[redacted]

From: WaterGridMedia [redacted]
Sent: Monday, 17 January 2011 6:29 AM
To: [redacted]
Cc: Dan Spiller; WaterGridMedia
Subject: Talking points Wivenhoe Dam releases
Attachments: Talking points_Wivenhoe Dam releases.docx

Categories: T8

[redacted]

See attached the Wivenhoe Dam talking points. We are working on a media release now based on these points.

Regards

[redacted]

Water Grid Communications

[redacted]

www.watergrid.com.au

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

SEQ Water Grid

Talking Points

TRIM reference: D/11/	Enquiry received:
Purpose: Wivenhoe Dam release	

Impacts of Wivenhoe and Somerset dams

- Wivenhoe and Somerset dams reduced the flood peak by 2.5 metres in the City and 5.5 metres at Moggill.
- Without the dams, up to 13,000 more houses would have been flooded. They prevented up to $1.6 billion of damages.
- Without the dams, major flooding would have lasted for three days.
- Wivenhoe and Somerset dams controlled 2.6 million megalitres of floodwater. This is 1.1 million megalitres more than in 1974.
- The dams controlled these floodwaters, providing time for peak flows from the Lockyer and Bremer to pass.
- Total flow in the Brisbane River in 1974 was 9,500 cubic metres per second. The estimated flow from this event would have been 13,000 cubic metres per second if Wivenhoe did not exist.

Operation of Wivenhoe and Somerset dams

- The dams were operated strictly in accordance with the approved Operational Procedures.
- The Operational Procedures were developed by Australia's best hydrologists, including:
    - Professor Colin Apelt, Head of Department, Department of Civil Engineering, University of Queensland
    - Mr Eric Lesleighter, Principal Hydraulic Engineer and Chief Engineer Water Resources, Snowy Mountains Engineering Corporation.
- Professor Apelt is Chair of the Brisbane City Council flood taskforce.

Rainfall forecasts

- Dam operations were based on forecasts provided by the Bureau of Meteorology.
- The rainfall during the event exceeded all forecasts.

- Rainfall was local and intense, as demonstrated by the tragic events in Toowoomba.
- It is unreasonable to expect that dam operators could foresee these events.

Pre-emptive releases

- The dam has been designed for both water supply and flood mitigation.
- Detailed Operational Procedures have been developed by leading hydrologists over many years, with a review as recently as 2009. The procedures are based on the current full supply level.
- Water was released from the dam on 20 of the 25 days leading up to this event.
- A total of 1,450 million megalitres was released between October 2010 and this event.
- These releases isolated some residents and inconvenienced many more.
- The clear decision making process in the Manual was set down since 1992 and was reviewed in 2009 to reflect the installation of the Wivenhoe Spillway upgrade. That review included independent experts from the Bureau of Meteorology, Sunwater, Brisbane City Council and the Department of Environment and Resource Management.
- It is a manual which reflects safe operating practices based on detailed hydrological analysis and technical assessments of dam safety.

Peak releases

- Outflows from Wivenhoe Dam peaked on Tuesday 11 January 2011 at 397,000 ML.
- The impact of these releases was minimised by closing down releases quickly once inflows into the dam had peaked.
- The release rate was higher for three hours, but not sustained.
- These releases accounted for only part of the increase in river levels. The Bureau of Meteorology has stated that, even at their peak, outflows from Wivenhoe Dam contributed slightly more than half the flood arriving in Brisbane (Courier Mail, 14 January).

Large releases earlier

- Releasing large volumes of water over the weekend would have had major impacts on the rural communities of the Brisbane Valley. Bridges would have been cut and communities would have been isolated with little notice.
- Over the weekend, neither rainfall forecasts nor the rain on the ground indicated with certainty that urban areas would be impacted.

Increases to above 200% (level of fuse plugs)

- Wivenhoe Dam is not designed to overtop. If it did, the dam would fail and the resulting damage and loss of life would be at least 100 to 1,000 times greater than that currently being experienced.
- To ensure that this never occurs, the dam has been designed with plugs that automatically open when it reaches more than 200% of full supply volume.
- Once opened, the rate of release through these plugs cannot be varied.
- The plugs continue to release water at this rate until the dam reaches full supply level.
- The plugs would take four to six months of dry weather to repair, rendering the flood storage compartment useless.

Changes to dam operations

- The upgrade required to meet ANCOLD standards would have had no impact on this event. It will be completed for even bigger floods.
- Options to increase the full supply level have been investigated. Had they been implemented, these options would have reduced the flood compartment, resulting in higher releases earlier.

[redacted]

From: WaterGridMedia[redacted]
Sent: Monday, 17 January 2011 7:55 AM
To: [redacted]
Cc: Dan Spiller; WaterGridMedia[redacted]; Barry Dennien
Subject: Media release for approval
Attachments: Media release_Dam operators explain operating decisions_17.01.11.doc

Importance: High

Categories: T8

Hi [redacted]

Please see attached media release for approval – as requested by the Minister's Office. I understand we are waiting on an updated version of the graph from your end also.

Minister's Office would like this over to them within the next half hour if possible.

Thanks

[redacted]

Water Grid Communications

[redacted]

www.watergrid.com.au

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

SEQ Water Grid

Media Release

Dam operators explain operating decisions

The operators of Wivenhoe Dam have explained operating decisions from last week's flood event, confirming all releases from Wivenhoe Dam were in accordance with the region's Flood Mitigation Manual.

SEQ Water Grid spokesperson Barry Dennien said the Wivenhoe Dam performed well and according to modelling reduced the flood peak by an estimated 2.5 metres in central Brisbane City and 5.5 metres at Moggill – essentially sparing 13,000 more houses and reducing the flood period by three days.

Wivenhoe and Somerset Dams controlled more than 2.6 million megalitres of flood water during last week's flood event, as guided by operating decisions – a volume almost twice that of the 1974 floods.

Mr Dennien said the Flood Mitigation Manual guides operating decisions and is based on several years work from Australia's leading hydrologists.

"The team operating the Wivenhoe Dam followed this manual and worked to make the best decisions based on the information that was available at that time."

Forecasts provided by the Bureau of Meteorology also guided the decisions of last week's dam operations.

Mr Dennien said the rainfall during last week's flood event exceeded all forecasts.

"It must be acknowledged that weather is an unpredictable element, including the total inflows that then flow into the region's dams.

"Everything was done based on the best predictions available at that time – completely by the book. We are proud of the performance of our dam and the people who managed it," said Mr Dennien.

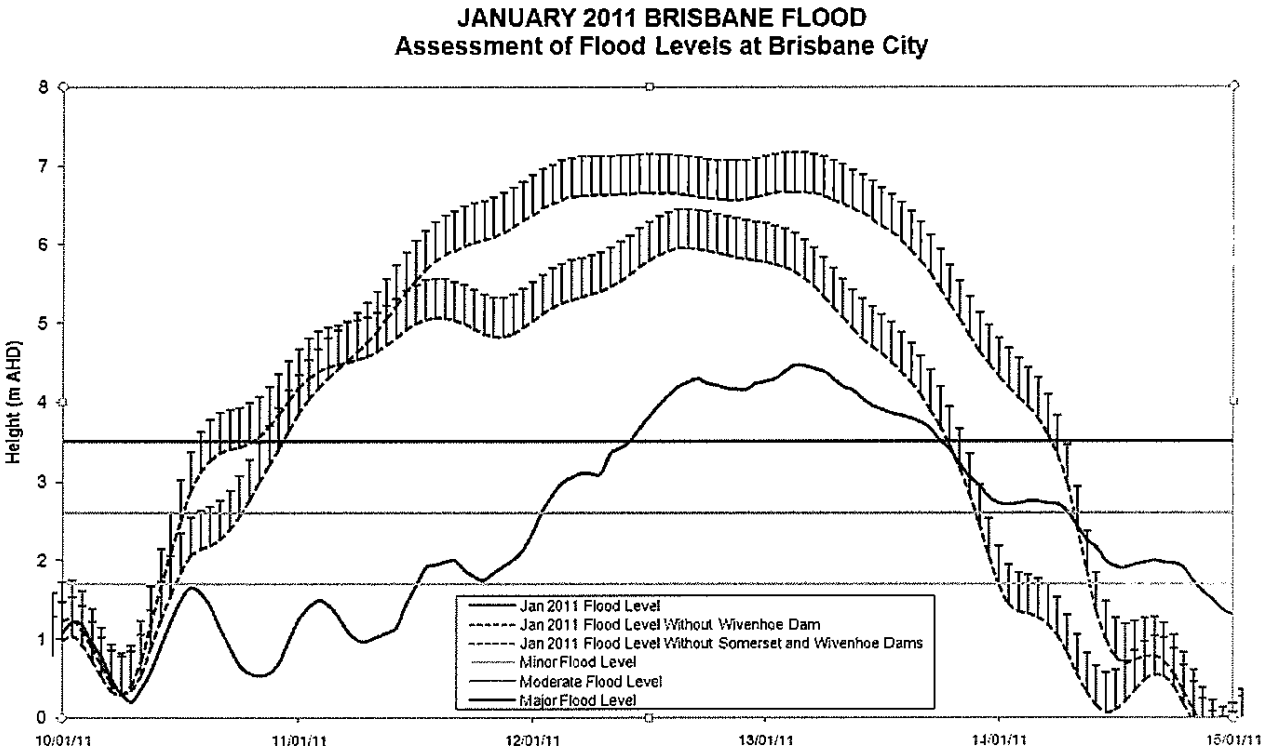
As quoted in today's The Australian - A senior hydrologist, Greg Roads, who helped design a recent upgrade at the dam, and a Queensland disaster risk scientist, Ken Granger, said the experts operating Wivenhoe Dam were among the best in Australia and would have done everything by the book.

"We are very comfortable with the way the manual has been adopted and I would not be sitting here with this level of confidence if I did not think that everything happened the right way," Mr Dennien said.

The total flow in the Brisbane River during the 1974 floods was 9,500 cubic meters per second. The estimated flow from last week's flood event would have been 13,000 cubic metres per second if Wivenhoe did not exist.

ENDS

Image: Predicted flood levels in Brisbane City without the support of Wivenhoe and Somerset Dams.



About the SEQ Water Grid

Established in June 2008, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure and is a world class asset in water management in both times of drought and deluge.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

[redacted]

From: Barry Dennien
Sent: Monday, 17 January 2011 8:14 AM
To: Dan Spiller; [redacted]
Subject: FW: Article from [redacted] Australian
Attachments: What went on in Brisbane.pdf

Categories: T8

From: Peter Borrows [redacted]
Sent: Monday, 17 January 2011 7:54 AM
To: Duty Seq; Rob Drury
Cc: Jim Pruss; Barry Dennien; Peter Borrows
Subject: Article from Mick O"Brien Australian

John, as discussed.

Regards, Peter.

Peter Borrows
Chief Executive Officer
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au



Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

What went on in Brisbane?

Was this a natural disaster or a manmade disaster?

First a bit of a disclaimer – I am new to some of this river data and may not have interpreted it all correctly.

First a bit of background: -

- Somerset Dam has a Water Storage capacity of 379,849ML with an additional 524,000ML for flood storage. The dam is rated as 100% full when all the water storage capacity is full. Therefore when both the water storage capacity and flood storage are fully utilised, the dam would be at 238%.
- Wivenhoe has a Water Storage capacity of 1,165,238ML with an additional 1,450,000ML for flood storage. Similarly when both the water storage capacity and flood storage are fully utilised, the dam would be at 224%.
- Somerset is upstream of Wivenhoe and flood flows from Somerset are discharged into Wivenhoe.
- There is a river height monitor at Wivenhoe Dam: -Station Number: 540177 Name: Brisbane R at Wivenhoe Dam Hw # Owner: SEQWCO:143822

SEQWater operate a web site which gives levels in all dams, including Somerset and Wivenhoe; but interestingly, levels for Wivenhoe and Somerset were not updated between 08:00 11th February and 09:00 13th February during the peak of the emergency. Historical data now shown for this period on the SEQWater web site does not show any peak during this period and so are obviously incorrect.

I have therefore used the Wivenhoe Dam river height monitor as a proxy for the dam level during this period. There are some interesting disconnects between the river level data and the reported water levels in Wivenhoe: -

> Information from media reports had Wivenhoe at a peak of 191% overnight for the night of 11th/12th; but generally at 190% through most of the emergency period.
>
> The river height shows a height of 73.77m at the time SEQWater were reporting a Wivenhoe capacity of 175.9%. The river experienced a minor peak of 74.51m commencing at 14:57m Tue 11th falling substantially (to 74.19m around 17:45 Tue 11th) until peaking again at 74.85m between 18:00 and 19:23 on Wed 12th (compared to a reported peak in Wivenhoe during the night of 11th/12th). The river level fell gradually, and has continued to fall, from this peak.

The sequence of events for the current flooding event seems to be: -

- 06:30 Tue 04th, Wivenhoe first went above 100% (i.e. using the flood storage capacity).
- Wivenhoe continued to rise, and on Mon 10th it was reported that "managers scrambled to increase the release from 116,000ML to 170,000ML per day.
- At 0800/0900 Tue 11th Wivenhoe was at 175.9%, Somerset at 160.8%; total available capacity for flood storage in both dams stood at 858,642ML. This is the last available data from SEQWater. At this stage the River height at the dam was 73.77m.
- The river (and by assumption the Wivenhoe dam) continued to rise over the next six hours and reached an interim peak of 74.51m at 14:57 Tue 11th.
- At this time the river level started to fall quickly to 74.19m around 17:45 Tue 11th

- Media reports indicate that the discharge from Wivenhoe was increased from 344,00ML/d through 490,000ML/d (both reported by the Courier Mail) to an overnight peak of 645,000ML/d (reported in a media release by the Queensland Police Service).
- SEQWater reported that at 0730 on Wed 12th the releases from Wivenhoe were reduced temporarily to 215,000ML/d to allow Lockyer Creek peak to enter Brisbane River and would subsequently be increased to maintain a maximum flow through Moggill of 301,000ML/d.

Some additional data: -

- SEQWater report that there is a delay of approximately 36 hours between a release at Wivenhoe and a peak at the Brisbane City Gauge.
- It is likely that the rapid drop in the river level at Wivenhoe commencing around 14:57 Tue 11th were due to a substantial increase in the discharge rate from Wivenhoe (645,000ML/d?).
- At around the same time, 16:03 on Tue 11th the Courier Mail reported that Wivenhoe was at 190% and Somerset at 176%, indicating a total capacity for additional flood storage of 636,000ML.
- 36 hours from 14:57 Tue 11th is 02:57 Thu 13th which corresponds almost identically with the peak of 4.46m experienced at the Brisbane City Gauge.

Now for an attempt at interpretation of this sequence: -

- SEQWater were very slow to respond to the initial increase in levels at Wivenhoe and took 6 days before there was any real increase in rate of release from Wivenhoe to return the dam to proper flood management levels. Even though there is apparently a legislated requirement to manage this over 7 days.
- SEQWater then substantially over responded during the afternoon of Tue 11th increasing the discharge to 645,000ML/d. This was at a much higher rate than the current water inflows, resulting in a substantial drop in the level in Wivenhoe. This was even though there was approximately 636,000ML of capacity available for additional flood storage in Wivenhoe and Somerset.
- This substantial increase in the discharge from Wivenhoe was the cause (sole cause?) of the peak in the Brisbane River.
- Early on Wed 12th (07:30), SEQWater recognised that this discharge rate was excessive and reduced it substantially to 215,000ML/d. This discharge rate has been sufficient to ensure that the river level at Wivenhoe (and presumably the dam) did not continue to increase and indeed has allowed the level to gradually fall.

The serious questions are: -

- Why did SEQWater not allow the total available flood storage capacity of Wivenhoe to be utilised during this period?
- What justification was there for the substantial increase in discharge from Wivenhoe to 645,000ML/d when a release rate of 215,000ML/d has been demonstrably sufficient to stop the levels in Wivenhoe rising and while there remained substantial capacity in Wivenhoe for additional flood storage?
- Was this increase to 645,000ML/d the sole reason for the significant flooding in Brisbane?
- Why did it initially take SEQWater 6 days to respond to the gradually increasing water levels in Wivenhoe which reduced its flood control capacity?

[redacted] 13th January 2011

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Monday, 17 January 2011 8:27 AM
To: Rob Drury; Dan Spiller; Peter Borrows; [redacted] Jim Pruss;
Cc: [redacted]
Subject: RE: Technical Report W59
Attachments: Technical_Situation_Report_W59.docx

Attached is report W59.

Somerset almost to 100%, only a valve is open.

Wivenhoe to be closed around Wednesday, closing sequence may start today.

North Pine closed.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W59	Date of TSR release	17.1.2011	Time of TSR release	7am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Gradual release of stored floodwaters with minimal impact.	
Strategy	• Peak inflows into Wivenhoe were in excess of 12000 cumecs. • Most of Somerset drained into Wivenhoe. • Manage releases from Wivenhoe to maintain around 3500cumecs at Moggill • Begin closing of Wivenhoe aiming at around Wednesday for final closure. This is also prior to any higher tide levels.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Total event inflows expected around 2,600,000ML.
	Rainfall:	Minimal
	Lockyer/Bremer:	Monitoring
	Brisbane River:	Impact as below.

Rainfall

There has been no significant rainfall in the last 24 hours and no significant rainfall is expected in the next twenty-four hours.

Somerset/Wivenhoe

Somerset Dam peaked at 105.11 mAHD at 06:00 on 12 January 2011.

At 6am Somerset was 99.07m and 382,829ML at 100.8% and discharging through cone valves. All sluices are shut.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

The releases from Wivenhoe Dam are being managed to achieve a target flow of around 3,500 m3/s at Moggill. This release will then be maintained to drain the flood storage component by around Wednesday 19th January with a closing sequence to start today some time.

At 6am Wivenhoe Dam was 69.4 m AHD at 1,441,983ML and 123.8% and dropping and discharging around 3,477cumecs and this flow will be maintained until the closing sequence begins. Aim is for final closure on Wednesday.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At 6am North Pine Dam was 39.54mAHD and 213,024ML and 99.4% and all gates were closed. The current level is expected to increase to stay around this level. This could be higher if further rainfall occurs.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels throughout the Brisbane and Pine River catchments and is maintaining close contact with warning agencies and local councils.

Leslie Harrison Dam:
Gates closed.

Hinze Dam:
A release of around 6,800megalitres a day is being made through the emergency gates. The Lake Level is dropping and the gate should be closed around Tuesday next week. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weother/rain forecasts, Tropical Cyclone Warning etc) and ather updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	18.1.2011	Time	9am	or Event	

[redacted]

From: Dan Spiller
Sent: Monday, 17 January 2011 8:31 AM
To: [redacted]
Cc: 'Bradley John'
Subject: Talking points_Wivenhoe Dam releases
Attachments: Talking points_Wivenhoe Dam releases.docx

Categories: T8

[redacted]

Updated version including notes about review.

Dan

SEQ Water Grid

Talking Points

TRIM reference: D/11/	Enquiry received:
Purpose: Wivenhoe Dam release	

Impacts of Wivenhoe and Somerset dams

- Wivenhoe and Somerset dams reduced the flood peak by 2.5 metres in the City and 5.5 metres at Moggill.
- Without the dams, up to 13,000 more houses would have been flooded. They prevented up to $1.6 billion of damages.
- Without the dams, major flooding would have lasted for three days.
- Wivenhoe and Somerset dams controlled 2.6 million megalitres of floodwater. This is 1.1 million megalitres more than in 1974.
- The dams controlled these floodwaters, providing time for peak flows from the Lockyer and Bremer to pass.
- Total flow in the Brisbane River in 1974 was 9,500 cubic metres per second. The estimated flow from this event would have been 13,000 cubic metres per second if Wivenhoe did not exist.

Operation of Wivenhoe and Somerset dams

- The dams were operated strictly in accordance with the approved Operational Procedures.
- The Operational Procedures were developed by Australia's best hydrologists, including:
    - Professor Colin Apelt, Head of Department, Department of Civil Engineering, University of Queensland
    - Mr Eric Lesleighter, Principal Hydraulic Engineer and Chief Engineer Water Resources, Snowy Mountains Engineering Corporation.
- Professor Apelt is Chair of the Brisbane City Council flood taskforce.

Flood report

- There is a regulatory requirement that Seqwater prepare a flood report.
- By regulation. the report will be submitted within six weeks of the gates closing.

- The report will be a comprehensive summary of all procedures, actions, outcomes and processes during the event. It will consider factors impacting on the protection of urban areas.
- The report will be reviewed by the Dam Safety Regulator and independent experts.
- The report and its review will be submitted to the Government and inform a review of the Operational Procedures.
- The review of Operational Procedures will utilise an expert panel o, including representatives of the Bureau of Meteorology and Councils.

Rainfall forecasts

- Dam operations were based on forecasts provided by the Bureau of Meteorology.
- The rainfall during the event exceeded all forecasts.
- Rainfall was local and intense, as demonstrated by the tragic events in Toowoomba.
- It is unreasonable to expect that dam operators could foresee these events.

Pre-emptive releases

- The dam has been designed for both water supply and flood mitigation.
- Detailed Operational Procedures have been developed by leading hydrologists over many years, with a review as recently as 2009. The procedures are based on the current full supply level.
- Water was released from the dam on 20 of the 25 days leading up to this event.
- A total of 1,450 million megalitres was released between October 2010 and this event.
- These releases isolated some residents and inconvenienced many more.
- The clear decision making process in the Manual was set down since 1992 and was reviewed in 2009 to reflect the installation of the Wivenhoe Spillway upgrade. That review included independent experts from the Bureau of Meteorology, Sunwater, Brisbane City Council and the Department of Environment and Resource Management.
- It is a manual which reflects safe operating practices based on detailed hydrological analysis and technical assessments of dam safety.

Peak releases

- Outflows from Wivenhoe Dam peaked on Tuesday 11 January 2011 at 397,000 ML.
- The impact of these releases was minimised by closing down releases quickly once inflows into the dam had peaked.
- The release rate was higher for three hours, but not sustained.
- These releases accounted for only part of the increase in river levels. The Bureau of Meteorology has stated that, even at their peak, outflows from Wivenhoe Dam contributed slightly more than half the flood arriving in Brisbane (Courier Mail, 14 January).

Large releases earlier

- Releasing large volumes of water over the weekend would have had major impacts on the rural communities of the Brisbane Valley. Bridges would have been cut and communities would have been isolated with little notice.
- Over the weekend, neither rainfall forecasts nor the rain on the ground indicated with certainty that urban areas would be impacted.

Increases to above 200% (level of fuse plugs)

- Wivenhoe Dam is not designed to overtop. If it did, the dam would fail and the resulting damage and loss of life would be at least 100 to 1,000 times greater than that currently being experienced.
- To ensure that this never occurs, the dam has been designed with plugs that automatically open when it reaches more than 200% of full supply volume.
- Once opened, the rate of release through these plugs cannot be varied.
- The plugs continue to release water at this rate until the dam reaches full supply level.
- The plugs would take four to six months of dry weather to repair, rendering the flood storage compartment useless.

Changes to dam operations

- The dam spillway was upgraded in 2007, increasing its release capacity in extreme floods. This upgrade is designed to ensure the structural integrity of the dam during floods significantly worse than the current event.

- A further upgrade of the spillway is scheduled to occur by 2035, in order to comply with ANCOLD upgrade. This upgrade is for even more extreme floods. It would have had no impact on the management of the current flood.
- Options to increase the full supply level have been investigated. Had they been implemented, these options would have reduced the flood compartment, resulting in higher releases earlier.

[redacted]

From: WaterGridMedia[redacted]
Sent: Monday, 17 January 2011 8:53 AM
To: [redacted]
Cc: Dan Spiller; Barry Dennien;[redacted] WaterGridMedia
Subject: Media release - Dam operators explain operating decisions
Attachments: Media release_Dam operators explain operating decisions_17.01.11.doc

Importance: High

Categories: T8

Hi [redacted]

See attached the draft media release as requested.

Please let us know if there is anything else you need.

Regards
[redacted]

From: WaterGridMedia
Sent: Monday, 17 January 2011 7:56 AM
To: [redacted]
Cc: [redacted]; WaterGridMedia
Subject: RE: Talking points Wivenhoe Dam releases

[redacted]

This is currently getting approval at our end – should be with you in the next 30mins.

Regards
[redacted]

From: [redacted]
Sent: Monday, 17 January 2011 7:41 AM
To: WaterGridMedia
Subject: RE: Talking points Wivenhoe Dam releases

Hi [redacted]

I know you're busy, but I was just wondering if you'd be able to give me an indication as to what time you think MR might be in our hands?

Thank you and regards,

[redacted]

Assistant Media Advisor
Office of the Hon. Stephen Robertson MP
Minister for Natural Resources, Mines and Energy and Minister for Trade

[redacted]

From: WaterGridMedia [redacted]
Sent: Monday, 17 January 2011 6:29 AM
To: [redacted]
Cc: [redacted]VaterGridMedia
Subject: Talking points Wivenhoe Dam releases

Hi [redacted]

See attached the Wivenhoe Dam talking points. We are working on a media release now based on these points.

Regards

[redacted]

Water Grid Communications

[redacted]

www.watergrid.com.au

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and /or publication of this email is also prohibited.

Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.

Please consider the environment before printing this email.

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

Media Release

Media release
17.01.11

Dam operators explain operating decisions

The operators of Wivenhoe Dam have explained operating decisions from last week's flood event, confirming all releases from Wivenhoe Dam were in accordance with the region's Flood Mitigation Manual.

SEQ Water Grid spokesperson Barry Dennien said the Wivenhoe Dam performed well and according to modelling reduced the flood peak by an estimated 2.5 metres in central Brisbane City and 5.5 metres at Moggill – essentially sparing 13,000 more houses and reducing the flood period by three days.

Wivenhoe and Somerset Dams controlled more than 2.6 million megalitres of flood water during last week's flood event, as guided by operating decisions – a volume almost twice that of the 1974 floods.

Mr Dennien said the Flood Mitigation Manual guides operating decisions and is based on several years work from Australia's leading hydrologists.

"Seqwater's Flood Control Centre, which operates the Wivenhoe Dam, followed this manual and worked to make the best decisions based on the real-time information that was available at that time and forecasts provided by the Bureau of Meteorology."

Mr Dennien said the rainfall during last week's flood event exceeded all forecasts.

"It must be acknowledged that weather is, at times, an unpredictable element, including the total inflows that then flow into the region's dams.

"Everything was done based on the best predictions available at that time – completely by the book. We are proud of the performance of our dam and the people who managed it," said Mr Dennien.

As quoted in today's The Australian - A senior hydrologist, Greg Roads, who helped design a recent upgrade at the dam, and a Queensland disaster risk scientist, Ken Granger, said the experts operating Wivenhoe Dam were among the best in Australia and would have done everything by-the-book.

"We are very comfortable with the way the manual has been adopted and I would not be sitting here with this level of confidence if I did not think that everything happened the right way," Mr Dennien said.

The total flow in the Brisbane River during the 1974 floods was 9,500 cubic meters per second. The estimated flow from last week's flood event would have been 13,000 cubic metres per second if Wivenhoe did not exist.

ENDS

About the SEQ Water Grid

Established in June 2008, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure and is a world class asset in water management in both times of drought and deluge.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

[redacted]

From: WaterGridMedia [redacted]
Sent: Monday, 17 January 2011 8:57 AM
To: [redacted]
Cc: Dan Spiller; [redacted] Barry Dennien
Subject: RE: Media release for approval

Categories: T8

Hi [redacted]

Thanks for your phone call. As discussed, we have left the reference to the BOM forecast in the release and it is currently with the Minister's Office.

Thanks for your help with this.

[redacted]

From: [redacted]
Sent: Monday, 17 January 2011 8:33 AM
To: WaterGridMedia
Cc: [redacted]
Subject: RE: Media release for approval

One deletion

From: WaterGridMedia [redacted]
Sent: Monday, 17 January 2011 07:55
To: [redacted]
Cc: [redacted]
Subject: Media release for approval
Importance: High

H [redacted]

Please see attached media release for approval – as requested by the Minister's Office. I understand we are waiting on an updated version of the graph from your end also.

Minister's Office would like this over to them within the next half hour if possible.

Thanks

[redacted]

Water Grid Communications

[redacted]

www.watergrid.com.au

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.

For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

[redacted]

From: [redacted]
Sent: Monday, 17 January 2011 9:32 AM
To: SEQWGM Media; Reception; [redacted]
[redacted] Dan Spiller; [redacted]
Cc: [redacted] Reception
Subject: 1800# update

Categories: T8

As at 9.00am on Monday 17 January, the following applies:

SOMERSET DAM:
The dam is at 100% capacity and discharging through cone valves. All sluice gates are closed.

WIVENHOE DAM:
Wivenhoe Dam is at 123% and dropping, discharging around 299,000 megalitres a day and this flow will be maintained until the closing sequence begins. At this stage, gates are expected to be closed mid week.

The Flood Operations Centre is continuing to monitor inflows and water levels through the Brisbane and Pine catchments and reviewing operating strategy.

The Centre is also maintaining close contact with warning agencies and local councils.

Due to the releases, Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge Colleges Crossing, Fernvale Bridge, and Mt Crosby Weir Bridge may be inundated until the middle of next week.

NORTH PINE DAM:
All gates are closed.

LESLIE HARRISON DAM:
No releases.

HINZE DAM:
Only a minor release is being made through the emergency gates.

For detailed information on river levels, road and crossing closures and other potential impacts, always contact your local council.

RECREATION UPDATE

Seqwater recreation areas may need to remain closed until the sites can be properly inspected and public safety can be assessed. All recreation sites at Lake Somerset and Lake Wivenhoe (including the Spillway Lookout recreation area at Lake Wivenhoe) will remain closed until further notice. Visitors are advised to avoid travelling to Seqwater sites during the flood situation, even if roads are open.

This information will be updated on Tuesday 17 January, or if any significant changes occur.

Regards,

[redacted]
Communications Advisor
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au



Please consider the environment before printing this email.
Think b4 u print | 1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere | 3 sheets of A4 paper = 1 litre of water

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Dan Spiller

From: Rob Drury [redacted]
Sent: Monday, 17 January 2011 9:43 AM
To: Dan Spiller
Subject: RE: Technical Report W59

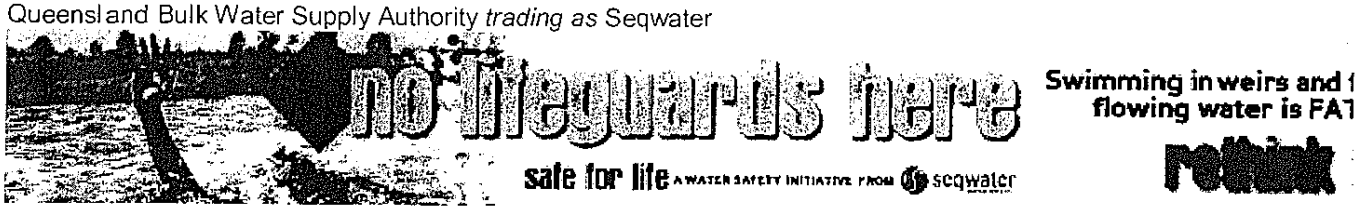
The FOC is tracking the levels closely and if it is all on track, they will make a call around lunchtime and hopefully begin a closing sequence mid-afternoon, but can't be 100% sure quite yet.

And final closure still planned for Wednesday, probably in the morning but that will be monitored tomorrow.

They will ensure BCC is aware of the plans and timing once they have a more definite time.
And let ICC and Somerset know as well re their bridges.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Dan Spiller [redacted]
Sent: Monday, 17 January 2011 9:28 AM
To: Rob Drury
Subject: Re: Technical Report W59

Rob,

The LM is very anxious about the closure sequence.

Can you provide any further details for 10? Verbal is fine if I can call at 9.45.

I presume you are also speaking to the BCC blokes.

Dan

On 17/01/2011, at 8:27 AM, "Rob Drury" [redacted]

Attached is report W59.

Somerset almost to 100%, only a valve is open.

Wivenhoe to be closed around Wednesday, closing sequence may start today.

North Pine closed.

Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.jpg>

<image002.png>

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

<Technical_Situation_Report_W59.docx>

Litsupport Brisbane

From: [redacted]
Sent: Monday, 17 January 2011 9:52 AM
To: [redacted] Dan Spiller; SEQWGM Media
Cc: [redacted] Peter Borrows; [redacted] Rob Drury; [redacted]
Subject: FW: Draft talking points for Wivenhoe Dam
Attachments: Talking points_Wivenhoe Dam releases (FINAL).docx

[redacted] /Dan

Couple of minor changes.

Can confirm dam levels will return to FSL following plug openings.

This will mean any subsequent rainfall and inflow events increasing levels above FSL will result in uncontrolled releases.

Cheers Mike

From: WaterGridMedia [redacted]
Sent: Monday, 17 January 2011 9:15 AM
To: [redacted] Mike Foster
Cc: [redacted] WaterGridMedia
Subject: Draft talking points for Wivenhoe Dam

Hi team

Draft Wivenhoe Dam talking points attached.

Regards
[redacted]

Water Grid Communications

[redacted]

www.watergrid.com.au

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

SEQ Water Grid

Talking Points

TRIM reference: D/11/	Enquiry received:
Purpose: Wivenhoe Dam release	

Impacts of Wivenhoe and Somerset dams

- Wivenhoe and Somerset dams reduced the flood peak by 2.5 metres in the City and 5.5 metres at Moggill.
- Without the dams, up to 13,000 more houses would have been flooded. They prevented up to $1.6 billion of damages.
- Without the dams, major flooding would have lasted for three days.
- Wivenhoe and Somerset dams controlled 2.6 million megalitres of floodwater. This is 1.1 million megalitres more than in 1974.
- The dams controlled these floodwaters, providing time for peak flows from the Lockyer and Bremer to pass.
- Total flow in the Brisbane River in 1974 was 9,500 cubic metres per second. The estimated flow from this event would have been 13,000 cubic metres per second if Wivenhoe did not exist.

Operation of Wivenhoe and Somerset dams

- The dams were operated strictly in accordance with the approved Operational Procedures.
- The Operational Procedures were developed by Australia's best hydrologists, including:
    - Professor Colin Apelt, Head of Department, Department of Civil Engineering, University of Queensland
    - Mr [redacted] Principal Hydraulic Engineer and Chief Engineer Water Resources, Snowy Mountains Engineering Corporation.
- Professor Apelt is Chair of the Brisbane City Council flood taskforce.

Flood report

- There is a regulatory requirement that Seqwater prepare a flood report.
- By regulation. the report will be submitted within six weeks of the gates closing.

- The report will be a comprehensive summary of all procedures, actions, outcomes and processes during the event. It will consider factors impacting on the protection of urban areas.
- The report will be reviewed by the Dam Safety Regulator and independent experts.
- The report and its review will be submitted to the Government and inform a review of the Operational Procedures.
- The review of Operational Procedures will utilise an expert panel o, including representatives of the Bureau of Meteorology and Councils.

Rainfall forecasts

- Dam operations were based on forecasts provided by the Bureau of Meteorology.
- The rainfall during the event exceeded all forecasts.
- Rainfall was local and intense, as demonstrated by the tragic events in Toowoomba.
- It is unreasonable to expect that dam operators could foresee these events.

Pre-emptive releases

- The dam has been designed for both water supply and flood mitigation.
- Detailed Operational Procedures have been developed by leading hydrologists over many years, with a review as recently as 2009. The procedures are based on the current full supply level.
- Water was released from the dam on 20 of the 25 days leading up to this event.
- A total of 1,450 million megalitres was released between October 2010 and this event.
- These releases isolated some residents and inconvenienced many more.
- The clear decision making process in the Manual was set down since 1992 and was reviewed in 2009 to reflect the installation of the Wivenhoe Spillway upgrade. That review included independent experts from the Bureau of Meteorology, Sunwater, Brisbane City Council and the Department of Environment and Resource Management.
- It is a manual which reflects safe operating practices based on detailed hydrological analysis and technical assessments of dam safety.

Peak releases

- Outflows from Wivenhoe Dam peaked on Tuesday 11 January 2011 at 397,000 ML.
- The impact of these releases was minimised by closing down releases quickly once inflows into the dam had peaked.
- The release rate was higher for three hours, but not sustained.
- These releases accounted for only part of the increase in river levels. The Bureau of Meteorology has stated that, even at their peak, outflows from Wivenhoe Dam contributed slightly more than half the flood arriving in Brisbane (Courier Mail, 14 January).

Large releases earlier

- Releasing large volumes of water over the weekend would have had major impacts on the rural communities of the Brisbane Valley. Bridges would have been cut and communities would have been isolated with little notice.
- Over the weekend, neither rainfall forecasts nor the rain on the ground indicated with certainty that urban areas would be impacted.

Increases to above 200% (level of fuse plugs)

- Wivenhoe Dam is not designed to overtop. If it did, the dam would fail and the resulting damage and loss of life would be at least 100 to 1,000 times greater than that currently being experienced.
- To ensure that this never occurs, the dam has been designed with plugs that automatically open when it reaches more than 200% of full supply volume.
- Once opened, the rate of release through these plugs cannot be varied.
- The plugs continue to release water at this rate until the dam reaches full supply level.
- The plugs would take four to six months of dry weather to repair, rendering the flood storage compartment useless.

Changes to dam operations

- The dam spillway was upgraded in 2007, increasing its release capacity in extreme floods. This upgrade is designed to ensure the structural integrity of the dam during floods significantly worse than the current event.
- A further upgrade of the spillway is scheduled to occur by 2035, in order to comply with ANCOLD upgrade. This upgrade is for even more extreme floods. It would have had no impact on the management of the current flood.

- Options to increase the full supply level have been investigated. Had they been implemented, these options would have reduced the flood compartment, resulting in higher releases earlier.

[redacted]

From: Dan Spiller
Sent: Monday, 17 January 2011 10:13 AM
To: [redacted]
Cc:
Subject: RE: Draft talking points for Wivenhoe Dam

Categories: T8

[redacted]

I think the FSL return is a kicker. It means that there would be zero control over events such as we experienced since October. Without the dam flood compartment, how many of those events would have resulted in total flows at Moggill in excess of 3,500 cumecs? My guess is that it would have been at least three times.

Regards,
Dan

From: [redacted]
Sent: Monday, January 17, 2011 9:52 AM
To: [redacted] Dan Spiller; SEQWGM Media
Cc: Peter Borrows; [redacted] Rob Drury; [redacted]
Subject: FW: Draft talking points for Wivenhoe Dam

[redacted]/Dan

Couple of minor changes.

Can confirm dam levels will return to FSL following plug openings.

This will mean any subsequent rainfall and inflow events increasing levels above FSL will result in uncontrolled releases.

[redacted]

From: WaterGridMedia [redacted]
Sent: Monday, 17 January 2011 9:15 AM
To: [redacted] Mike Foster
Cc: dan.spiller[redacted] WaterGridMedia
Subject: Draft talking points for Wivenhoe Dam

Hi team

Draft Wivenhoe Dam talking points attached.

Regards

[redacted]

Water Grid Communications

[redacted]

www.watergrid.com.au

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

----------Safe Stamp----------

Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

Dan Spiller

From: Dan Spiller
Sent: Monday, 17 January 2011 10:17 AM
To: 'Rob Drury'
Cc: 'Peter Borrows'
Subject: RE: Technical Report W59
Attachments: image001.jpg; image002.png

Thanks Rob.

BCC and MRD are very concerned about the integrity of Coronation Drive and the impact of the river level changes as flows reduce. Can you please ensure that BCC endorses the closure sequence, and specifically ask that they consult with their transport areas? It may require a specific meeting with them.

Regards,
Dan

From: Rob Drury [redacted]
Sent: Monday, January 17, 2011 9:43 AM
To: Dan Spiller
Subject: RE: Technical Report W59

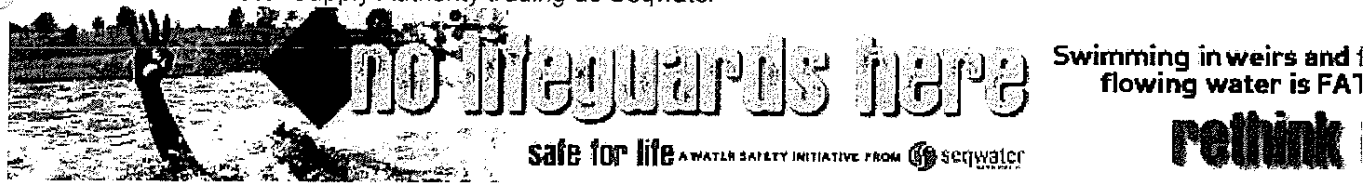
The FOC is tracking the levels closely and if it is all on track, they will make a call around lunchtime and hopefully begin a closing sequence mid-afternoon, but can't be 100% sure quite yet.

And final closure still planned for Wednesday, probably in the morning but that will be monitored tomorrow.

They will ensure BCC is aware of the plans and timing once they have a more definite time.
And let ICC and Somerset know as well re their bridges.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater





[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Dan Spiller [redacted]
Sent: Monday, 17 January 2011 9:28 AM

To: Rob Drury
Subject: Re: Technical Report W59

Rob,

The LM is very anxious about the closure sequence.

Can you provide any further details for 10? Verbal is fine if I can call at 9.45.

I presume you are also speaking to the BCC blokes.

Dan

On 17/01/2011, at 8:27 AM, "Rob Drury" [redacted] wrote:

Attached is report W59.

Somerset almost to 100%, only a valve is open.

Wivenhoe to be closed around Wednesday, closing sequence may start today.

North Pine closed.

Rob

Robert Drury

Dam Operations Manager

Water Delivery

Queensland Bulk Water Supply Authority *trading as* Seqwater

<image001.jpg>

<image002.png>

[redacted]

Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306

Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

<Technical_Situation_Report_W59.docx>

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

[redacted]

From: Dan Spiller
Sent: Monday, 17 January 2011 10:41 AM
To: 'Peter Borrows'; Barry Dennien
Subject: FW: Article from [redacted] Australian
Attachments: What went on in Brisbane.pdf

Categories: T8

Peter,

I think the response is a good start. Below are some issues that I suggest you also consider now that there is a little more time:

- At risk of stating the obvious, the paper contains no reference to the flows from the Lockyer and Bremer. I suggest that the response needs to highlight this, and in particular that the dam releases are managed with reference to total flows at the Moggill gauge. Reference to dam releases only significantly underestimates the total flows and their impact on the Brisbane River - and particularly the Brisbane Valley.
- I also think it is important to highlight difference between forecast and actual rainfall, as the BoM has done itself.
- I think it is critical that we quantify the extent of the impact of the swift reduction in flows as soon as possible. As you advised last night, total releases on Tuesday were 397,000 ML. If this was averaged across the day, it is equivalent to about 4,600 cumecs - which is significantly less than the peak rate. I suspect the actual impact of the peak releases will be somewhere in between.

Dan

From: Barry Dennien
Sent: Monday, January 17, 2011 8:14 AM
To: Dan Spiller; [redacted]
Subject: FW: Article from [redacted] Australian

From: Peter Borrows[redacted]
Sent: Monday, 17 January 2011 7:54 AM
To: Duty Seq; Rob Drury
Cc: Jim Pruss; Barry Dennien; Peter Borrows
Subject: Article from [redacted] Australian

John, as discussed.

Regards, Peter.

Peter Borrows
Chief Executive Officer
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]

Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002

Website | www.seqwater.com.au



Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

What went on in Brisbane?

Was this a natural disaster or a manmade disaster?

First a bit of a disclaimer – I am new to some of this river data and may not have interpreted it all correctly.

First a bit of background: -

- Somerset Dam has a Water Storage capacity of 379,849ML with an additional 524,000ML for flood storage. The dam is rated as 100% full when all the water storage capacity is full. Therefore when both the water storage capacity and flood storage are fully utilised, the dam would be at 238%.
- Wivenhoe has a Water Storage capacity of 1,165,238ML with an additional 1,450,000ML for flood storage. Similarly when both the water storage capacity and flood storage are fully utilised, the dam would be at 224%.
- Somerset is upstream of Wivenhoe and flood flows from Somerset are discharged into Wivenhoe.
- There is a river height monitor at Wivenhoe Dam: -Station Number: 540177 Name: Brisbane R at Wivenhoe Dam Hw # Owner: SEQWCO:143822

SEQWater operate a web site which gives levels in all dams, including Somerset and Wivenhoe; but interestingly, levels for Wivenhoe and Somerset were not updated between 08:00 11th February and 09:00 13th February during the peak of the emergency. Historical data now shown for this period on the SEQWater web site does not show any peak during this period and so are obviously incorrect.

I have therefore used the Wivenhoe Dam river height monitor as a proxy for the dam level during this period. There are some interesting disconnects between the river level data and the reported water levels in Wivenhoe: -

> Information from media reports had Wivenhoe at a peak of 191% overnight for the night of 11th/12th; but generally at 190% through most of the emergency period.
>
> The river height shows a height of 73.77m at the time SEQWater were reporting a Wivenhoe capacity of 175.9%. The river experienced a minor peak of 74.51m commencing at 14:57m Tue 11th falling substantially (to 74.19m around 17:45 Tue 11th) until peaking again at 74.85m between 18:00 and 19:23 on Wed 12th (compared to a reported peak in Wivenhoe during the night of 11th/12th). The river level fell gradually, and has continued to fall, from this peak.

The sequence of events for the current flooding event seems to be: -

- 06:30 Tue 04th, Wivenhoe first went above 100% (i.e. using the flood storage capacity).
- Wivenhoe continued to rise, and on Mon 10th it was reported that "managers scrambled to increase the release from 116,000ML to 170,000ML per day.
- At 0800/0900 Tue 11th Wivenhoe was at 175.9%, Somerset at 160.8%; total available capacity for flood storage in both dams stood at 858,642ML. This is the last available data from SEQWater. At this stage the River height at the dam was 73.77m.
- The river (and by assumption the Wivenhoe dam) continued to rise over the next six hours and reached an interim peak of 74.51m at 14:57 Tue 11th.
- At this time the river level started to fall quickly to 74.19m around 17:45 Tue 11th

- Media reports indicate that the discharge from Wivenhoe was increased from 344,00ML/d through 490,000ML/d (both reported by the Courier Mail) to an overnight peak of 645,000ML/d (reported in a media release by the Queensland Police Service).
- SEQWater reported that at 0730 on Wed 12th the releases from Wivenhoe were reduced temporarily to 215,000ML/d to allow Lockyer Creek peak to enter Brisbane River and would subsequently be increased to maintain a maximum flow through Moggill of 301,000ML/d.

Some additional data: -

- SEQWater report that there is a delay of approximately 36 hours between a release at Wivenhoe and a peak at the Brisbane City Gauge.
- It is likely that the rapid drop in the river level at Wivenhoe commencing around 14:57 Tue 11th were due to a substantial increase in the discharge rate from Wivenhoe (645,000ML/d?).
- At around the same time, 16:03 on Tue 11th the Courier Mail reported that Wivenhoe was at 190% and Somerset at 176%, indicating a total capacity for additional flood storage of 636,000ML.
- 36 hours from 14:57 Tue 11th is 02:57 Thu 13th which corresponds almost identically with the peak of 4.46m experienced at the Brisbane City Gauge.

Now for an attempt at interpretation of this sequence: -

- SEQWater were very slow to respond to the initial increase in levels at Wivenhoe and took 6 days before there was any real increase in rate of release from Wivenhoe to return the dam to proper flood management levels. Even though there is apparently a legislated requirement to manage this over 7 days.
- SEQWater then substantially over responded during the afternoon of Tue 11th increasing the discharge to 645,000ML/d. This was at a much higher rate than the current water inflows, resulting in a substantial drop in the level in Wivenhoe. This was even though there was approximately 636,000ML of capacity available for additional flood storage in Wivenhoe and Somerset.
- This substantial increase in the discharge from Wivenhoe was the cause (sole cause?) of the peak in the Brisbane River.
- Early on Wed 12th (07:30), SEQWater recognised that this discharge rate was excessive and reduced it substantially to 215,000ML/d. This discharge rate has been sufficient to ensure that the river level at Wivenhoe (and presumably the dam) did not continue to increase and indeed has allowed the level to gradually fall.

The serious questions are: -

- Why did SEQWater not allow the total available flood storage capacity of Wivenhoe to be utilised during this period?
- What justification was there for the substantial increase in discharge from Wivenhoe to 645,000ML/d when a release rate of 215,000ML/d has been demonstrably sufficient to stop the levels in Wivenhoe rising and while there remained substantial capacity in Wivenhoe for additional flood storage?
- Was this increase to 645,000ML/d the sole reason for the significant flooding in Brisbane?
- Why did it initially take SEQWater 6 days to respond to the gradually increasing water levels in Wivenhoe which reduced its flood control capacity?

[redacted] 13th January 2011

[redacted]

From: WaterGridMedia [redacted]
Sent: Monday, 17 January 2011 11:05 AM
Subject: WATER GRID MEDIA UPDATE - 17 January 2011

Categories: T8: Media

WATER GRID MEDIA UPDATE

17 January 2011, 11.00am

CONTROLLED RELEASES FROM WIVENHOE DAM CONTINUE

NOTE: All SEQ dams remain safe, stable and operating within their design specifications.

Wivenhoe Dam is at 123 per cent capacity and continues to drop steadily. Releases continue at around 299,000 megalitres per day and this flow will be maintained to drain the flood storage compartment.

The continuing releases are necessary in order to prepare Wivenhoe for any future weather events should they occur. It is expected that releases from Wivenhoe Dam will cease mid-week.

Inflows and water levels continue to be monitored in the Brisbane and Pine catchments.

Somerset Dam is at 100 per cent with small discharges through the cone valves into Wivenhoe.

Releases are being made in consultation with the Bureau of Meteorology and local councils and every effort is being made to limit downstream impacts where possible.

Due to a combination of Lockyer Creek, local runoff and Wivenhoe releases, Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge, Colleges Crossing, Fernvale Bridge, and Mt Crosby Weir Bridge may be inundated until the middle the week.

Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

All recreations areas around Somerset and Wivenhoe are closed, and given the dam levels and the need for safety around spillways, we will not be able to facilitate any land-based media access to our sites. People are advised not to travel to any recreation sites during the flood crisis, even if the roads are open.

Recreation sites may need to remain closed until they can be properly inspected and any public safety issues assessed.

North Pine Dam is at 99 per cent and all five gates remain closed.

Water has spilled from Wyaralong Dam after it exceeded 100 per cent capacity earlier last week.

A minor release of around 6,800 megalitres a day is being made through the emergency gates at Hinze Dam. This release may reduce slowly over the next few days but will continue until mid-week. There is no public access to the spillway.

For detailed information on river levels, road and crossing closures and other potential impacts, always contact your local council.

WATER QUALITY

Water across Brisbane and the Sunshine and Gold Coasts remains safe to drink. While some people may see minor discolouration of their tap water, they should not be concerned. Water Grid suppliers are continually monitoring water quality across the network as well working closely with Queensland Health.

While Queensland Urban Utilities have a precautionary Boiled Water Alert currently in place for Marburg, water in the Ipswich area is also safe to drink.

Boil water alerts are in place for locations in the Lockyer Valley and Somerset council areas and residents and businesses are urged to visit the Queensland Urban Utilities website www.urbanutilities.com.au for more details.

ENDS

Owing to technical issues caused by the flood, a temporary email contact is in use. Please email to watergridmedia@linkwater.com.au

Community Assistance

Please direct the community to contact telephone - 1800 613 122. This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.
Members of the public seeking information on potential impacts in their local areas should direct inquiries to their local councils.

About the SEQ Water Grid

Established in June 2008, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure and is a world class asset in water management in both times of drought and deluge.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further details contact the SEQ Water Grid Communications Unit on:

[redacted]

Email: watergridmedia@linkwater.com.au

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

[redacted]

From: WaterGridMedia [redacted]
Sent: Monday, 17 January 2011 11:18 AM
To: Dan Spiller
Cc: Barry Dennien
Subject: Updated talking points for BCC attached
Attachments: Talking points for BCC_Wivenhoe Dam releases (v2).doc

Categories: T8

Hi Dan

See attached updated talking points from Barry.

Andrew will walk down a printed copy now.

Thanks

[redacted]

Water Grid Communications

[redacted]

www.watergrid.com.au

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

SEQ Water Grid

Talking Points

TRIM reference: D/11/	Enquiry received:
Purpose: Wivenhoe Dam release	

Impacts of Wivenhoe and Somerset dams

- Wivenhoe and Somerset dams reduced the flood peak by 2.5 metres in the City and 5.5 metres at Moggill.
- Without the dams, up to 13,000 more houses would have been flooded. They prevented up to $1.6 billion of damages.
- Without the dams, major flooding would have lasted for three days.
- Wivenhoe and Somerset dams controlled 2.6 million megalitres of floodwater. This is 1.1 million megalitres more than in 1974.
- The dams controlled these floodwaters, providing time for peak flows from the Lockyer and Bremer to pass.
- Total flow in the Brisbane River in 1974 was 9,500 cubic metres per second. The estimated flow from this event would have been 13,000 cubic metres per second if Wivenhoe did not exist.

Operation of Wivenhoe and Somerset dams

- The dams were operated strictly in accordance with the approved Operational Procedures.
- The Operational Procedures were developed by Australia's best hydrologists, including:
    - Professor Colin Apelt, Head of Department, Department of Civil Engineering, University of Queensland
    - Mr [redacted] Principal Hydraulic Engineer and Chief Engineer Water Resources, Snowy Mountains Engineering Corporation.
- Professor Apelt is Chair of the Brisbane City Council flood taskforce.

Flood report

- There is a regulatory requirement that Seqwater prepare a flood report.
- By regulation. the report will be submitted within six weeks of the gates closing.

- The report will be a comprehensive summary of all procedures, actions, outcomes and processes during the event. It will consider factors impacting on the protection of urban areas.
- The report will be reviewed by the Dam Safety Regulator and independent experts.
- The report and its review will be submitted to the Government and inform a review of the Operational Procedures.
- The review of Operational Procedures will utilise an expert panel, including representatives of the Bureau of Meteorology and Councils.

Rainfall forecasts

- Dam operations were based on forecasts provided by the Bureau of Meteorology.
- The rainfall during the event exceeded all forecasts.
- Rainfall was local and intense, as demonstrated by the tragic events in Toowoomba.

Litsupport Brisbane

From: Peter Borrows [redacted]
Sent: Monday, 17 January 2011 1:41 PM
To: Barry Dennien; Dan Spiller
Cc: Peter Borrows; Jim Pruss; Rob Drury
Subject: FW: Flood Manual and Report
Attachments: Doc#942353 - Complete Report_Flood Events at Wivenhoe, Somerset and North Pine Dams for February and March 2010_June 2010.PDF; WD-SD-Rev 7 -FINAL_Uncontrolled Copy.pdf

Barry, the report for October 2010 has not been finalised. It was overtaken by subsequent floods and releases. I do not have a finish date for this yet.

Regards, Peter.

Peter Borrows
Chief Executive Officer
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au



From: Rob Drury
Sent: Monday, 17 January 2011 1:37 PM
To: Peter Borrows
Subject: Flood Manual and Report

Peter,
Attached is the Flood Manual and the latest event report. It is for March 2010 as the October one is still being prepared due to the recent events.

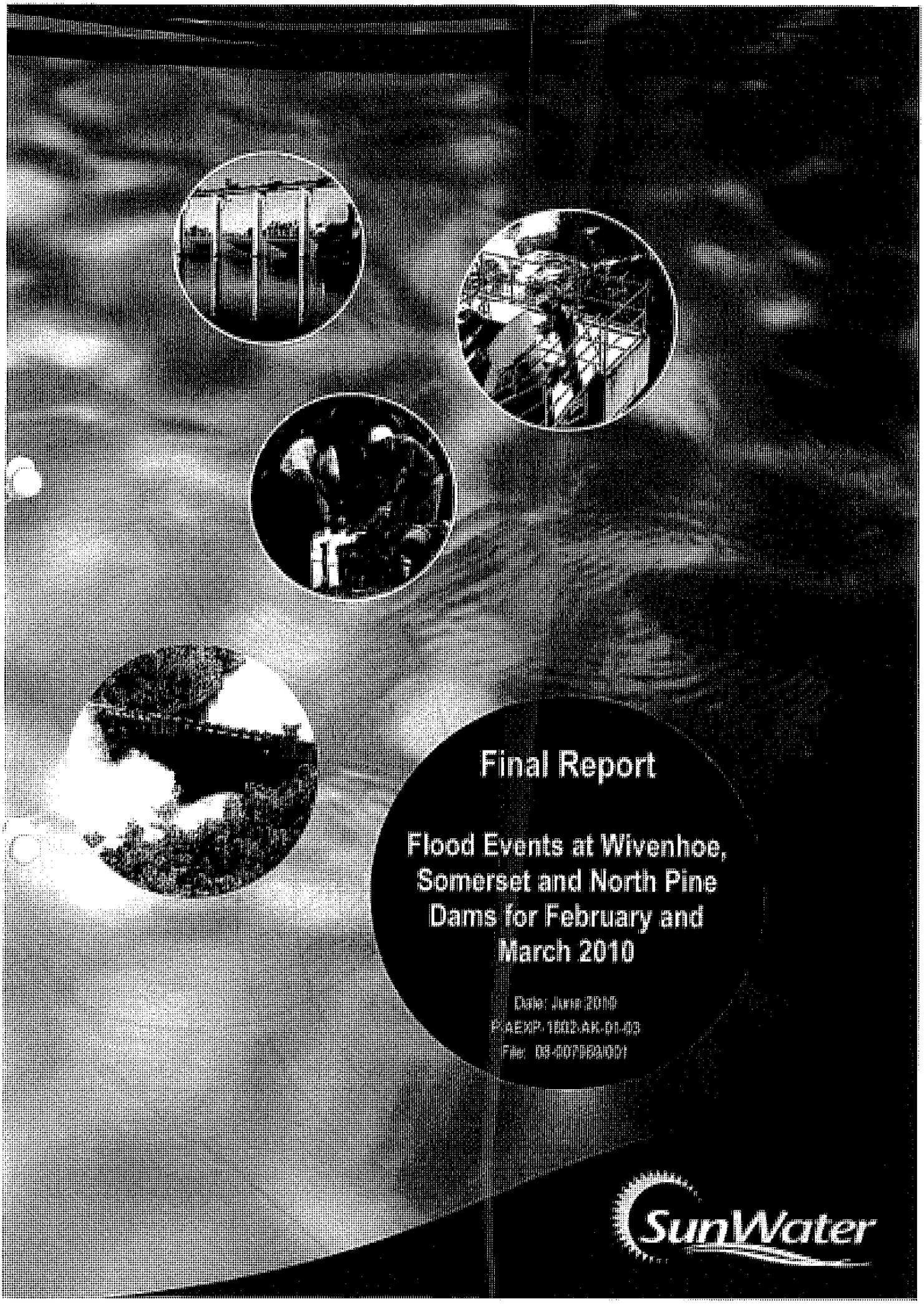
Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).



Final Report

Flood Events at Wivenhoe, Somerset and North Pine Dams for February and March 2010

Date: June 2010

P-AEXP-1002-AK-01-03

File: 03-007983/001

SunWater

D778

Prepared by:

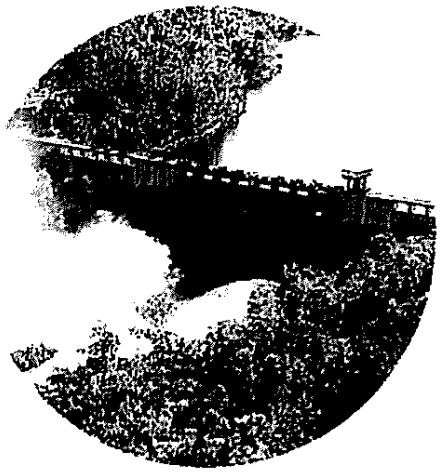
SunWater Limited
ACN 131 034 985

179 Turbot Street, Brisbane
PO Box 15536 City East
Brisbane Queensland Australia 4002

Tel: +61 7 3120 0153
Fax: +61 7 3120 0242

Author: [redacted]
Headworks Design Manager
Infrastructure Development

Approved: [redacted]
Manager, Engineering South
Infrastructure Development



Final Report

Flood Events at Wivenhoe, Somerset and North Pine Dams for February and March 2010

Date: June 2010
P-AEXP-1802-AK-01-03
File: 08-007969/001

Prepared for:
Seqwater

This report has been produced by SunWater, to provide information for client use only.
The information contained in this report is limited by the scope and the purpose of the engineering study, and should not be regarded as completely exhaustive.
Permission to use or quote information from this report in studies external to the Corporation must first be obtained from the Chief Executive, SunWater.

TABLE OF CONTENTS

1.0 INTRODUCTION 1
2.0 FLOOD EVENT SUMMARY 2
2.1 FEBRUARY 2010 2
2.2 MARCH 2010 3
3.0 MOBILISATION AND STAFFING 5
3.1 16TH TO 18TH FEBRUARY 2010 5
3.2 1ST TO 4TH MARCH 5
3.3 5TH TO 6TH MARCH 5
3.4 6TH TO 7TH MARCH 6
3.5 10TH TO 11TH MARCH 6
4.0 EVENT RAINFALL 7
4.1 FEBRUARY 2010 7
4.2 MARCH 2010 9
5.0 INFLOW AND RELEASE DETAILS 12
5.1 16TH TO 18TH FEBRUARY 2010 12
5.2 1ST MARCH 2010 15
5.3 6 / 7TH MARCH 2010 18
5.4 11TH MARCH 2010 21
6.0 DATA COLLECTION SYSTEM PERFORMANCE 25
6.1 NETWORK AVAILABILITY 25
6.2 RAINFALL 25
6.3 STREAM HEIGHT 26
6.3.1 Main Stream 26
6.3.2 Back-up Stream 27
6.3.3 Headwater Sensors 27
6.3.4 Sensor Calibration 28
6.3.5 Stream Height Rating Curves 28
7.0 DATA ANALYSIS PERFORMANCE 29
7.1 RUNOFF-ROUTING MODELS 29
7.2 BASEFLOW ASSESSMENT 29
8.0 COMMUNICATIONS 31
8.1 EVENT LOG 31
8.2 DECLARATION OF EVENT MOBILISATION 31

D780

8.3 SHIFT HANDOVER 32
9.0 FLOOD MANAGEMENT STRATEGIES 33
9.1 16TH TO 18TH FEBRUARY 2010 33
9.1.1 North Pine Dam 33
9.2 26TH FEBRUARY TO 4TH MARCH 35
9.2.1 Somerset and Wivenhoe Dam 35
9.2.2 North Pine Dam 38
9.3 4TH MARCH TO 7TH MARCH 41
9.3.1 North Pine Dam 41
9.4 10TH MARCH TO 11TH MARCH 44
9.4.1 North Pine Dam 44
10.0 RECOMMENDATIONS & CONCLUSIONS 46
10.1 DATA COLLECTION 46
10.2 DATA ANALYSIS 46
10.3 DIRECTIVES AND STATUS REPORTS 46
10.4 OPERATIONAL STRATEGIES 47

LIST OF APPENDICES

APPENDIX A - FOC Attendance Logs & Event Logs

APPENDIX B - Estimated Inflows and Release

APPENDIX C - Reservoir Headwater Levels

D781

LIST OF TABLES

Table 2.1: Storage Status Prior to February 2010 Event 2
Table 2.2: Dam Operations in March 2010 3
Table 4.1: February 2010 Sub-Catchment Rainfalls (mm) 7
Table 4.2: March 2010 Sub-Catchment Rainfalls (mm) 9
Table 5.1: Peak Flood Level and Flows – 16th to 18th February 2010 12
Table 5.2: Somerset Dam – 16th February to 20th February 2010 14
Table 5.3: Wivenhoe Dam – 16th February to 20th February 2010 14
Table 5.4: North Pine Dam – 16th February to 18th February 2010 14
Table 5.5: Peak Flood Level and Flows – 1st March 2010 15
Table 5.6: Somerset Dam – 24th February to 18th March 2010 17
Table 5.7: Wivenhoe Dam – 24th February to 18th March 2010 17
Table 5.8: North Pine Dam – 26th February to 4th March 2010 18
Table 5.9: Peak Flood Level and Flows – 6/7th March 2010 19
Table 5.10: North Pine Dam – 4th March to 6th March 2010 21
Table 5.11: Peak Flood Level and Flows – 11th March 2010 22
Table 5.12: North Pine Dam – 10th March to 11th March 2010 24
Table 9.1: North Pine Dam Gate Settings – 17th to 18th February 2010 35
Table 9.2: Somerset Dam gate Settings – 24th February 18th March 37
Table 9.3: North Pine Dam Gate Settings – 1st to 4th March 2010 39
Table 9.4: North Pine Dam Gate Settings – 5th to 7th March 2010 42
Table 9.5: North Pine Dam Gate Settings – 10th to 11th March 2010 45

D782

1.0 INTRODUCTION

South East Queensland was influenced by several rainfall events of tropical origin during February and March 2010 resulting in the mobilization and operation of North Pine Dam and Somerset Dam. This report contains details of those events and is prepared in accordance with the requirements of the following Flood Operation Manuals:

- Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam, Revision 7 November 2009
- Manual of Operational Procedures for Flood Releases from North Pine Dam, Revision 4, September 2007

Section 2.9 of these Manuals requires the preparation of a suitable report at the completion of a flood event. The *'report shall contain details of the procedures used, the reasons therefore and other pertinent information.'*. This document contains a combined report covering the operation of North Pine Dam and Somerset Dam during the February and March 2010 flood events.

D783

2.0 FLOOD EVENT SUMMARY

2.1 FEBRUARY 2010

In the week prior to the February 2010 flood event, the weather was predominantly hot and sultry. The catchments of the three dams were dry with low antecedent moisture stores. No runoff was reported throughout the catchments of the dams although rainfall earlier in the month did produce some inflows.

Table 2.1 summarises the storage situation at 09:00 on Tuesday 16th February 2010. It shows that there was significant storage capacity (in relative terms) available in Wivenhoe Dam, but Somerset Dam and North Pine Dam were near full supply level.

Table 2.1: Storage Status Prior to February 2010 Event

Dam	Current Level (m AHD)	% Full Supply Storage	Runoff to Fill (mm)	Antecedent Precipitation Index	Expected Initial Loss (mm)	Reqd Rain at 5mm/hr to Operate	Reqd Rain at 10 mm/hr to Operate	
Somerset (FSL 99.0 m)	98.22	92	24	58	37	77	67	
Wivenhoe (FSL 67.0 m)	61.86	61	64	37	46	153	126	Incl Somerset
			79			178	145	Excl Somerset
North Pine (FSL 39.6 m)	39.51	99	6	76	29	41	36	

The Bureau of Meteorology (BoM) issued a Severe Thunderstorm Warning for Southeast Queensland at 14:00 on Tuesday 16th February 2010. The BoM, via Quantitative Precipitation Forecasts (QPF), also predicted moderate to heavy rainfall commencing that afternoon.

D784

Storm rainfalls affected most of the Brisbane and Pine River catchments with heavier falls occurring in the coastal ranges and in the south around the Bremer River catchment. The flood rainfalls resulted in significant runoff in the Stanley and Pine River catchments. This required the operation of North Pine Dam, whilst Somerset Dam experienced some substantial inflows, but did not exceed Full Supply Level.

The FOC was mobilized at 12:00 on Tuesday 16th February 2010, in response to the storm rainfalls and in recognition of the elevated storage levels in North Pine Dam and to a lesser extent Somerset Dam. North Pine Dam achieved FSL at 00:55 on Wednesday 17th February 2010 and gate trigger level later in the morning at 05:15. Gate operations continued until 09:00 on Thursday 18th February 2010. The FOC was de-mobilised at around 11:00 on Thursday 18th February 2010.

2.2 MARCH 2010

In March, a deep low that developed in the Northern Territory and which tracked across western Queensland eventually resulted in significant flood producing rainfalls across the catchments of North Pine, Somerset and Wivenhoe Dams. This event resulted in water releases (including gate operations) at both North Pine Dam and Somerset Dam. Releases were generally made in accordance with the Manuals of Flood Operations and the Water Supply Act 2008. Details of the gate operations are summarized as follows:

Table 2.2: Dam Operations in March 2010

Event Dates	Dams Requiring Flood Release
1 to 4 March	North Pine Dam, Somerset Dam
5/6 March	North Pine Dam
6/7 March	North Pine Dam
10/11 March	North Pine Dam

D785

The main flood event was associated with the rainfall that commenced on Monday 1st March 2010. The rainfall associated with the overall event effectively fell in two bursts:

- 48 hours to 09:00 am 3 March
- 24 hours to 09:00 am 7 March

These bursts were separated by periods of generally light rainfall.

The FOC was mobilised at 08:00 on Monday 1st March 2010 in response to the heavy rainfall and in recognition that both North Pine Dam and Somerset Dam were at or close to Full Supply Level or gate trigger level.

The FOC was de-mobilised on Thursday 4th March and then re-mobilised on Friday 5th March and again on Saturday 6th March in response to base flow rises and subsequent rainfall events over the catchment of North Pine Dam. The FOC was de-mobilised on Sunday 7th March.

Another isolated storm event on the evening of Wednesday 10th March resulted in the FOC mobilizing again for releases from North Pine Dam. The FOC was de-mobilised on Thursday 11th March.

The rainfall associated with the 7th March resulted in Wivenhoe Dam being brought into consideration as the combined inflows from the Upper Brisbane catchment and Somerset Dam releases caused Lake Wivenhoe to reach EL 66.7 m AHD which is just 0.3m below Full Supply Level.

D786

3.0 MOBILISATION AND STAFFING

3.1 16TH TO 18TH FEBRUARY 2010

Terry Malone was the 'On Call' Duty Flood Operations Engineer for the week commencing 15th February 2010. At the commencement of heavy rainfall on Tuesday 16th February SDFOE Rob Ayre mobilized the FOC at 12:00 and Terry Malone commenced shift arrangements at 14:00. The shift roster for this event can be found in Appendix A.

In general terms the Flood Response Team within the FOC comprised one Duty Engineer and one Data Collector.

3.2 1ST TO 4TH MARCH

The flood event that commenced on 1st March 2010 involved both North Pine Dam and Somerset Dam. The FOC was mobilised by Duty Flood Operations Engineer John Ruffini at 08:00 as North Pine Dam was above FSL and approaching the gate trigger level of EL 39.65 m AHD. The shift roster for this event can be found in Appendix A.

In general terms the Flood Response Team within the FOC comprised one Duty Engineer and one or two Data Collectors.

Senior Duty Flood Operations Engineer Rob Ayre was unavailable for two days due to illness, so the remaining Duty Engineers conducted the roster for this event and John Ruffini fulfilled the role of relief SDFOE.

3.3 5TH TO 6TH MARCH

Duty Flood Operations Engineer John Tibaldi mobilised the FOC on Friday 5th March at 18:30. Base flows had resulted in the lake level rebounding back to gate trigger level, whilst rainfalls of 20 mm with possible isolated falls of 40 mm were forecast.

The actual rainfall was less than forecast, so the FOC was de-mobilised at 07:00 on Saturday 6th March once North Pine Dam had been drawn down to EL 39.52 m.

D787

3.4 6TH TO 7TH MARCH

Rainfall during Saturday 6th March resulted in the lake level at North Pine Dam exceeding FSL. Duty Flood Operations Engineer Terry Malone mobilised the FOC at 17:30 and initiated a drainage event which extended to 16:00 on Sunday 7th March.

Somerset Dam was also releasing flood water over this period and these releases combined with Upper Brisbane River flows resulted in Wivenhoe Dam rising by around 20% of its capacity.

3.5 10TH TO 11TH MARCH

A small isolated storm burst over North Pine Dam resulted in the lake level exceeding FSL. Duty Flood Operations Engineer Rob Ayre mobilised the FOC at 20:15 on Wednesday 10th March. The drainage event extended to 09:00 on Thursday 11th March.

D788

4.0 EVENT RAINFALL

4.1 FEBRUARY 2010

A summary of the daily and event rainfall that resulted in the gate operations at North Pine Dam is presented in Table 4.1.

Table 4.1: February 2010 Sub-Catchment Rainfalls (mm)

Catchment	Date			Total (mm)
	15 Feb	16 Feb	17 Feb	
Upper Brisbane	0	27	24	51
Middle Brisbane	0	32	10	42
Lower Brisbane	0	21	37	58
Stanley River	0	50	3	53
Lockyer Creek	0	15	48	53
Bremer River	0	20	74	94
PineRiver	0	53	5	58

D789

The 48 hour rainfall intensities for this event are not necessarily remarkable. Comparisons between individual station rainfall totals for the two day period to 9:00am 17 February 2010, indicates that the event rainfall totals were consistent:

- Mt Mee 136 mm in 48 hours
- Tarome 128 mm in 48 hours
- Kalbar 119 mm in 48 hours
- Adams Bridge 105 mm in 48 hours
- Rosewood 97 mm in 48 hours
- Top of Brisbane 91 mm in 48 hours
- Peachester 84 mm in 48 hours
- Boat Mountain 83 mm in 48 hours
- Helidon 77 mm in 48 hours
- Woodford 73 mm in 48 hours
- Baxters Creek 73 mm in 48 hours

These 48 hour intensities are around a 1 in 1 to 1 in 2 year AEP magnitude. However, embedded within the longer duration rainfalls there were periods of high intensity short duration bursts. Periods of between 1 and 3 hours produced rainfall intensities that were between 1 in 20 and 1 in 50 year AEP magnitudes.

4.2 MARCH 2010

A summary of the daily and event rainfall that resulted in the gate operations of each of the dams is presented in Table 4.2.

Table 4.2: March 2010 Sub-Catchment Rainfalls (mm)

Catchment	Date											
	1 Mar	2 Mar	3 Mar	4 Mar	5 Mar	6 Mar	7 Mar	8 Mar	9 Mar	10 Mar	11 Mar	Total (mm)
Upper Brisbane	5	60	30	3	2	29	28	4	2	0	1	164
Middle Brisbane	9	63	36	6	3	10	26	3	1	0	0	157
Lower Brisbane	26	70	47	21	5	17	9	5	1	0	0	201
Stanley River	17	67	38	12	12	13	41	4	1	0	6	211
Lockyer Creek	11	49	26	3	2	12	17	3	0	3	1	127
Bremer River	10	46	19	3	0	13	9	4	0	0	8	112
Pine River	23	80	58	12	8	20	16	3	0	0	7	227

The three day event totals to 9:00 on 3rd March are quite evenly distributed throughout the entire catchment. 72 hour rainfall totals for each of the catchments contributing to the dams are as follows:

- North Pine Dam 161 mm
- Somerset Dam 122 mm
- Wivenhoe Dam 102 mm

D791

Notable station rainfall totals during the 72 hour period to 9:00am 3rd March 2010 include:

- Mt Mee 190 mm
- Baxters Creek 185 mm
- Mt Glorious 178 mm
- Lake Kurwongbah 177 mm
- Petrie 150 mm
- Drapers crossing 145 mm
- North Pine Dam 133 mm
- Bellthorpe West 154 mm
- Somerset Dam 139 mm
- Woodford 128 mm
- Kilcoy 121 mm
- Jimna 113 mm
- Toogoolawah 125 mm
- Devon Hills 123 mm
- Caboonbah 122 mm
- Boat Mountain 117 mm

The follow up event covering the 6th and 7th of March resulted in catchment average totals for the 48 hours to 9:00 on 7th March as follows:

- North Pine Dam 36 mm
- Somerset Dam 54 mm
- Wivenhoe Dam 47 mm

D792

These 48 hour totals are not remarkable with an AEP of less than 1 in 1 year.

Notable station rainfall totals during the 48 hour period to 9:00am 7th March 2010 include:

- Mt Binga 107 mm
- Crows Nest 82 mm
- Mt Glorious 78 mm
- Mt Mee 69 mm
- Peachester 68 mm
- Boat Mountain 64 mm
- Yarraman 61 mm
- Woodford 53 mm
- Jimna 50 mm

The isolated storm rainfalls that occurred on the evening of Wednesday 10th March included 24 hour totals of:

- Thornton 52 mm
- Lake Kurwongbah 37 mm
- Stokes Crossing 28 mm
- Rosewood 22 mm

D793

5.0 INFLOW AND RELEASE DETAILS

5.1 16TH TO 18TH FEBRUARY 2010

A summary of the peak flows recorded within the Brisbane and Pine River catchments for the February 2010 flood event is presented in Table 5. The largest flows associated with this event were recorded in the Pine River, Stanley River and Upper Brisbane River catchments. Large runoff was also noted in the Bremer River and Warrill Creek towards the end of the event.

Table 5.1: Peak Flood Level and Flows – 16th to 18th February 2010

Station ID	Location	Peak Elevation (mAHD)	Peak Flow (m^3/s)	Date & Time
Upper Brisbane River				
6543	Cooyar Ck at Damsite	160.94	0	12:17 19 Feb 10
6718	Brisbane R at Linville	117.00	37	15:31 17 Feb 10
6709	Brisbane R at Devon Hills	100.37	-	01:52 17 Feb 10
6521	Emu Ck at Boat Mtn	109.78	37	05:17 17 Feb 10
6515	Brisbane R at Gregors Ck (A)	84.53	257	15:37 17 Feb 10
6518	Brisbane R at Gregors Ck (B)	87.67	-	15:52 17 Feb 10
6524	Cressbrook Ck at Cressbrook Dam HW	258.50	-	13:34 9 Mar 10
6554	Cressbrook Ck at Rosentretters Xing	103.42	2	18:05 18 Feb 10
Stanley River				
6776	Stanley R at Peachester	130.51	96	06:52 17 Feb 10
6706	Stanley R at Woodford (A)	111.97	55	01:50 17 Feb 10
6703	Stanley R at Woodford (B)	111.82	40	01:35 17 Feb 10
Lockyer Creek				
6527	Lockyer Ck at Helidon	129.83	7	15:13 16 Feb 10
6566	Tenthill Ck at Tenthill	OOA	-	-
6578	Lockyer Ck at Gatton	89.02	0	05:12 16 Feb 10
6554	Laidley Ck at Showground	102.24	24	07:24 16 Feb 10
6557	Lockyer Ck Glenore Grove	70.58	6	11:47 17 Feb 10
6634	Lockyer Ck at Lyons Br (A)	51.20	18	23:28 17 Feb 10
6631	Lockyer Ck at Lyons Br (B)	51.00	17	00:13 18 Feb 10
6655	Buaraba Ck at Clarendon	93.80	-	05:32 17 Feb 10
6569	Lockyer Ck at O'Reillys Weir	OOA	-	-

D794

Middle Brisbane River				
6650	Brisbane R at Lowood (A)	OOA	-	-
6647	Brisbane R at Lowood (B)	OOA	-	-
6560	Brisbane R at Savages Xing	20.36	46	22:31 18 Feb 10
6756	Brisbane R at Burtons Br	OOA	-	-
6757	Brisbane R at Kholo Xing	7.99	-	03:13 17 Feb 10
6752	Brisbane R at Mt Crosby (A)	7.40	60	03:53 17 Feb 10
6758	Brisbane R at Mt Crosby (B)	6.12	-	03:45 17 Feb 10
Bremer River				
6563	Warrill Ck at Kalbar	76.96 76.96	88 88	22;32 15 Feb 10 19:23 16 Feb 10
6572	Warrill Ck at Harrisville	50.28 49.58	- -	09:13 16 Feb 10 03:57 17 Feb 10
6652	Warrill Ck at Amberley (A)	30.51	-	20:20 16 Feb 10
	Warrill Ck at Amberley (B)	24.82	79	20:18 16 Feb 10
6581	Bremer R at Adams Bridge	78.61 78.01	61 29	00:17 16 Feb 10 21:59 16 Feb 10
6734	Bremer R at Rosewood	37.35	-	08:26 17 Feb 10
6551	Bremer R at Walloon (A)	26.43	66	13:45 17 Feb 10
6743	Bremer R at Walloon (B)	26.38	61	13;33 17 Feb 10
6740	Purga Ck at Washpool	OOA	-	-
2168	Bremer R at David Trumpy Br	2.44	-	13:37 17 Feb 10
Lower Brisbane River				
6755	Brisbane R at Moggill	4.74	-	13:15 17 Feb 10
6731	Brisbane R at Jindalee	1.50	-	12:32 17 Feb 10
6749	Brisbane R at Port Office	1.26	-	11:36 16 Feb 10
Pine River				
6712	North Pine R at Baxters Ck	1.90	48	22:39 16 Feb 10
6764	North Pine R at Petrie	0.87	-	10:45 17 Feb 10
6770	South Pine R at Drapers Xing	19.31	106	01:31 17 Feb 10

Where: OOA indicates that sensor is Out Of Action.

This event resulted in runoff into Somerset, Wivenhoe and North Pine Dams. Runoff events earlier in February (2nd and 8th) had resulted in an increase in levels at Somerset Dam and North Pine Dam. The change in status of the dams for this event is summarized in Tables 5.2, 5.3 and 5.4.

D795

Table 5.2: Somerset Dam – 16th February to 20th February 2010

Start EL (mAHD)	Start Capacity (ML)	Start Percentage (%)	End EL (mAHD)	End Capacity (ML)	End Percentage (%)	Inflow Volume (ML)	Release Volume (ML)
98.22	348,120	91.6	98.76	369,850	97.4	21,730	0

Table 5.3: Wivenhoe Dam – 16th February to 20th February 2010

Start EL (mAHD)	Start Capacity (ML)	Start Percentage (%)	End EL (mAHD)	End Capacity (ML)	End Percentage (%)	Inflow Volume (ML)	Release Volume (ML)
61.88	710,400	61.0	62.07	724,140	62.1	13,740	0

A plot of the estimated inflows into Wivenhoe Dam and Somerset Dam is provided in Figure B1 in Appendix B. The peak inflow into Wivenhoe Dam was estimated to be 90 m^3/s whilst the peak inflow into Somerset Dam was around 270 m^3/s. A plot of the recorded headwater levels of Wivenhoe Dam and Somerset Dam for this event can be found in Figures C1 and C2 in Appendix C.

Table 5.4: North Pine Dam – 16th February to 18th February 2010

Start EL (mAHD)	Start Capacity (ML)	Start Percentage (%)	End EL (mAHD)	End Capacity (ML)	End Percentage (%)	Inflow Volume (ML)	Release Volume (ML)
39.50	212,140	99.0	39.57	213,650	99.7	5,990	3,740

D796

North Pine Dam peaked at a level of 39.664 mAHD with a peak inflow of 207 m^3/s and a maximum release of 48 m^3/s. A plot of the estimated inflow and recorded release from North Pine Dam is shown in Figure B2 in Appendix B. A plot of the recorded headwater level for this event can be found in Appendix C as Figure C3.

5.2 1ST MARCH 2010

A summary of the peak flows recorded within the Brisbane and Pine River catchments for the early March 2010 flood event is presented in Table 5.5. The largest flows associated with this event were recorded in the Pine River, Stanley River and Upper Brisbane River catchments. Large runoff was also noted in Lockyer Creek.

This was the largest inflow event for Somerset Dam and North Pine Dam.

Table 5.5: Peak Flood Level and Flows – 1st March 2010

Station ID	Location	Peak Elevation (mAHD)	Peak Flow (m^3/s)	Date & Time
Upper Brisbane River				
6543	Cooyar Ck at Damsite	162.74	137	23:00 2 Mar 10
6718	Brisbane R at Linville	119.25	365	05:06 2 Mar 10
6709	Brisbane R at Devon Hills	102.87	-	06:17 3 Mar 10
6521	Emu Ck at Boat Mtn	111.63	184	01:31 3 Mar 10
6515	Brisbane R at Gregors Ck (A)	87.29	330	00:00 3 Mar 10
6518	Brisbane R at Gregors Ck (B)	94.67	-	00:12 3 Mar 10
6524	Cressbrook Ck at Cressbrook Dam HW	258.5	-	13:34 9 Mar 10
6554	Cressbrook Ck at Rosentretters Xing	105.37	52	20:57 2 Mar 10
Stanley River				
6776	Stanley R at Peachester	131.76	155	07:19 2 Mar 10
6706	Stanley R at Woodford (A)	113.77	294	00:03 3 Mar 10
6703	Stanley R at Woodford (B)	113.67	161	22:04 2 Mar 10
Lockyer Creek				
6527	Lockyer Ck at Helidon	130.93	47	17:34 2 Mar 10
6566	Tenthill Ck at Tenthill	OOA	-	-
6578	Lockyer Ck at Gatton	90.77	2	05:19 3 Mar 10
6554	Laidley Ck at Showground	102.04	12	03:35 3 Mar 10
6557	Lockyer Ck Glenore Grove	73.83	159	08:50 3 Mar 10

D797

6634	Lockyer Ck at Lyons Br (A)	56.25	132	20:26 3 Mar 10
6631	Lockyer Ck at Lyons Br (B)	55.90	119	19:33 3 Mar 10
6655	Buaraba Ck at Clarendon	97.98	-	02:33 3 Mar 10
6569	Lockyer Ck at O'Reillys Weir	OOA	-	-
Middle Brisbane River				
6650	Brisbane R at Lowood (A)	OOA	-	-
6647	Brisbane R at Lowood (B)	OOA	-	-
6560	Brisbane R at Savages Xing	21.88	188	11:05 3 Mar 10
6756	Brisbane R at Burtons Br	OOA	-	-
6757	Brishane R at Kholo Xing	8.79	-	12:34 3 Mar 10
6752	Brisbane R at Mt Crosby (A)	7.40	60	21:33 10 Mar 10
6758	Brisbane R at Mt Crosby (B)	6.30	-	17:11 3 Mar 10
Bremer River				
6563	Warrill Ck at Kalbar	76.36	42	22:31 2 Mar 10
6572	Warrill Ck at Harrisville	48.48	-	06:10 3 Mar 10
6652	Warrill Ck at Amberley (A)	29.12	-	04:46 3 Mar 10
6631	Warrill Ck at Amberley (B)	24.07	41	01:08 3 Mar 10
6581	Bremer R at Adams Bridge	77.71	19	22:16 2 Mar 10
6734	Bremer R at Rosewood	37.80	-	21:44 2 Mar 10
6551	Bremer R at Walloon (A)	27.38	156	01:35 3 Mar 10
6743	Bremer R at Walloon (B)	27.33	150	00:46 3 Mar 10
6740	Purga Ck at Washpool	OOA	-	-
2168	Bremer R at David Trumpy Br	3.32	-	14:05 3 Mar 10
Lower Brisbane River				
6755	Brisbane R at Moggill	6.19	-	13:18 3 Mar 10
6731	Brisbane R at Jindalee	2.05	-	12:41 3 Mar 10
6749	Brisbane R at Port Office	1.76	-	09:43 28 Feb 10
Pine River				
6712	North Pine R at Baxters Ck	3.00	90	19:04 2 Mar 10
6764	North Pine R at Petrie	3.32	-	23:44 2 Mar 10
6770	South Pine R at Drapers Xing	21.11	452	07:55 2 Mar 10

Where: OOA indicates that the sensor is Out Of Action

This event was the largest to impact Somerset Dam and North Pine Dam. Both dams were mobilized for flood operations for this event. Operational releases from Somerset Dam commenced in late February 2010 in response to base flows which were associated with the February flood event.

D798

The change in status of the dams for this event is summarized in Tables 5.6, 5.7 and 5.8. The start date for Somerset Dam and Wivenhoe Dam was 24th February 2010.

Table 5.6: Somerset Dam – 24th February to 18th March 2010

Start EL (mAHD)	Start Capacity (ML)	Start Percentage (%)	End EL (mAHD)	End Capacity (ML)	End Percentage (%)	Inflow Volume (ML)	Release Volume (ML)
98.80	371,520	97.8	98.99	379,430	99.9	215,830	207,920

Table 5.7: Wivenhoe Dam – 24th February to 18th March 2010

Start EL (mAHD)	Start Capacity (ML)	Start Percentage (%)	End EL (mAHD)	End Capacity (ML)	End Percentage (%)	Inflow Volume (ML)	Release Volume (ML)
61.88	715,420	61.4	66.54	1,116,570	95.8	401,150	0

Somerset Dam peaked at a level of EL 99.45 m AHD at 22:00 on Tuesday 2nd March 2010 with an estimated peak inflow of nearly 700 m^3/s and a maximum release of 885 m^3/s. A plot of the estimated inflow and recorded release from Somerset Dam is shown in Figure B3 in Appendix B. A plot of the recorded headwater level of Somerset dam is shown in Figure C5 in Appendix C.

Wivenhoe Dam peaked at a level of EL 66.69 m AHD at 16:45 on Friday 9th April 2010 due to the continuation of base flows from the event. The maximum estimated inflow into Wivenhoe Dam from the Upper Brisbane River was around 900 m^3/s whilst no releases were made from the dam. A plot of the estimated inflow into Wivenhoe Dam is shown in Figure B3 in Appendix B. A plot of the recorded headwater level for Wivenhoe Dam is shown as Figure C4 in Appendix C.

D799

Table 5.8: North Pine Dam – 26th February to 4th March 2010

Start EL (mAHD)	Start Capacity (ML)	Start Percentage (%)	End EL (mAHD)	End Capacity (ML)	End Percentage (%)	Inflow Volume (ML)	Release Volume (ML)
39.65	215,400	100.5	39.52	212,570	99.2	36,240	39,250

North Pine Dam peaked at a level of EL 39.915 m AHD at 23:00 on Tuesday 2nd March 2010 with an estimated peak inflow of 420 m^3/s and a maximum release of 360 m^3/s. A plot of the estimated inflow and recorded release from North Pine Dam is shown in Figure B4 in Appendix B. A plot of the recorded headwater level of North Pine Dam is shown in Figure C6 in Appendix C.

5.3 6 / 7TH MARCH 2010

A summary of the peak flows recorded within the Brisbane and Pine River catchments for the 6/7th March 2010 flood event is presented in Table 5.9. The largest flows associated with this event were recorded in the Pine River, Stanley River and Upper Brisbane River catchments. Large flows were also noted in Lockyer Creek.

This was the largest inflow event for Wivenhoe Dam as it resulted in a second peak in the inflow hydrograph.

D800

Table 5.9: Peak Flood Level and Flows – 6/7th March 2010

Station ID	Location	Peak Elevation (mAHD)	Peak Flow (m^3/s)	Date & Time
Upper Brisbane River				
6543	Cooyar Ck at Damsite	164.98	149	16:55 7 Mar 10
6718	Brisbane R at Linville	119.95	541	06:17 7 Mar 10
6709	Brisbane R at Devon Hills	103.62	-	09:24 7 Mar 10
6521	Emu Ck at Boat Mtn	113.13	381	23:13 6 Mar 10
6515	Brisbane R at Gregors Ck (A)	88.13	519	04:06 7 Mar 10
6518	Brisbane R at Gregors Ck (B)	96.82	-	04:36 7 Mar 10
6524	Cressbrook Ck at Cressbrook Dam HW	258.50	-	13:34 10 Mar 10
6554	Cressbrook Ck at Rosentretters Xing	105.42	55	20:29 6 Mar 10
Stanley River				
6776	Stanley R at Peachester	131.01	118	23:46 6 Mar 10
6706	Stanley R at Woodford (A)	112.92	164	15:03 7 Mar 10
6703	Stanley R at Woodford (B)	112.82	91	12:44 7 Mar 10
Lockyer Creek				
6527	Lockyer Ck at Helidon	130.68	35	18:35 6 Mar 10
6566	Tenthill Ck at Tenthill	OOA	-	-
6578	Lockyer Ck at Gatton	90.62	2	04:40 7 Mar 10
6554	Laidley Ck at Showground	102.49	36	19:39 6 Mar 10
6557	Lockyer Ck Glenore Grove	73.83	159	10:00 7 Mar 10
6634	Lockyer Ck at Lyons Br (A)	56.20	130	00:10 8 Mar 10
6631	Lockyer Ck at Lyons Br (B)	55.95	121	21:09 7 Mar 10
6655	Buaraba Ck at Clarendon	96.38	-	04:44 7 Mar 10
6569	Lockyer Ck at O'Reillys Weir	OOA	-	-

D801

Middle Brisbane River				
6650	Brisbane R at Lowood (A)	OOA	-	-
6647	Brisbane R at Lowood (B)	OOA	-	-
6560	Brisbane R at Savages Xing	21.58	153	13:09 8 Mar 10
6756	Brisbane R at Burtons Br	OOA	-	-
6757	Brisbane R at Kholo Xing	8.34	-	19:43 8 Mar 10
6752	Brisbane R at Mt Crosby (A)	7.40	60	21:33 10 Mar 10
6758	Brisbane R at Mt Crosby (B)	6.22	-	17:11 8 Mar 10
Bremer River				
6563	Warrill Ck at Kalbar	76.31	39	19:22 6 Mar 10
6572	Warrill Ck at Harrisville	48.13	-	02:23 7 Mar 10
6652	Warrill Ck at Amberley (A)	27.67	-	11:10 7 Mar 10
6631	Warrill Ck at Amberley (B)	23.37	22	10:35 7 Mar 10
6581	Bremer R at Adams Bridge	77.76	21	19:40 6 Mar 10
6734	Bremer R at Rosewood	37.50	-	05:49 7 Mar 10
6551	Bremer R at Walloon (A)	26.68	87	10:38 7 Mar 10
6743	Bremer R at Walloon (B)	26.63	83	10:44 7 Mar 10
6740	Purga Ck at Washpool	OOA	-	-
2168	Bremer R at David Trumpy Br	-	-	-
Lower Brisbane River				
6755	Brisbane R at Moggill	-	-	-
6731	Brisbane R at Jindalee	-	-	-
6749	Brisbane R at Port Office	-	-	-
Pine River				
6712	North Pine R at Baxters Ck	1.95	49	11:25 6 Mar 10
6764	North Pine R at Petrie	1.47	-	01:52 6 Mar 10
6770	South Pine R at Drapers Xing	19.76	181	23:23 6 Mar 10

D802

This event was effectively a continuation of the previous event due to the ongoing baseflows within the catchments and additional rainfalls. The baseflows resulted in North Pine Dam and Somerset Dam exceeding FSL and gate trigger levels, and so as a consequence further operations were required. The Somerset Dam operations were summarized in the previous section as the releases were continuous, whereas for North Pine Dam gate operations ceased on Thursday 4th March and then recommenced on Friday 5th March and again on Saturday 6th March.

Table 5.10: North Pine Dam – 4th March to 6th March 2010

Start EL (mAHD)	Start Capacity (ML)	Start Percentage (%)	End EL (mAHD)	End Capacity (ML)	End Percentage (%)	Inflow Volume (ML)	Release Volume (ML)
39.52	212,570	99.2	39.44	210,840	98.4	10,130	11,860

North Pine Dam peaked at a level of EL 39.657 m AHD at 19:30 on Friday 5th March 2010 with an estimated peak inflow of 47 m^3/s and a maximum release of 151 m^3/s. A plot of the estimated inflow and recorded release from North Pine Dam is shown in Figure B5 in Appendix B, whilst the recorded headwater level is shown as Figure C7 in Appendix C.

5.4 11TH MARCH 2010

A summary of the peak flows recorded within the Brisbane and Pine River catchments for the 11th March 2010 rainfall event is presented in Table 5.11. This event was associated with isolated storm falls which affected the Upper and Middle Brisbane River, Lower Lockyer Creek, Warrill Creek, Bremer River and the Pine River.

D803

Table 5.11: Peak Flood Level and Flows – 11th March 2010

Station ID	Location	Peak Elevation (mAHD)	Peak Flow (m^3/s)	Date & Time
Upper Brisbane River				
6543	Cooyar Ck at Damsite	162.19	3	16:55 9 Mar 10
6718	Brisbane R at Linville	117.55	87	02:05 10 Mar 10
6709	Brisbane R at Devon Hills	100.72	-	05:01 10 Mar 10
6521	Emu Ck at Boat Mtn	-	-	-
6515	Brisbane R at Gregors Ck (A)	-	-	-
6518	Brisbane R at Gregors Ck (B)	-	-	-
6524	Cressbrook Ck at Cressbrook Dam HW	258.50	-	13:34 9 Mar 10
6554	Cressbrook Ck at Rosentretters Xing	-	-	-
Stanley River				
6776	Stanley R at Peachester	-	-	-
6706	Stanley R at Woodford (A)	-	-	-
6703	Stanley R at Woodford (B)	-	-	-
Lockyer Creek				
6527	Lockyer Ck at Helidon	-	-	-
6566	Tenthill Ck at Tenthill	OOA	-	-
6578	Lockyer Ck at Gatton	-	-	-
6554	Laidley Ck at Showground	103.54	89	04:00 11 Mar 10
6557	Lockyer Ck Glenore Grove	70.43	6	17:19 11 Mar 10
6634	Lockyer Ck at Lyons Br (A)	51.80	25	02:24 12 Mar 10
6631	Lockyer Ck at Lyons Br (B)	51.40	20	03:09 12 Mar 10
6655	Buaraba Ck at Clarendon	-	-	-
6569	Lockyer Ck at O'Reillys Weir	OOA	-	-

D804

Middle Brisbane River				
6650	Brisbane R at Lowood (A)	OOA	-	-
6647	Brisbane R at Lowood (B)	OOA	-	-
6560	Brisbane R at Savages Xing	20.38	47	01:09 13 Mar 10
6756	Brisbane R at Burtons Br	OOA	-	-
6757	Brisbane R at Kholo Xing	7.54	-	13:00 13 Mar 10
6752	Brisbane R at Mt Crosby (A)	7.40	60	21:57 11 Mar 10
6758	Brisbane R at Mt Crosby (B)	6.02	-	18:41 13 Mar 10
Bremer River				
6563	Warrill Ck at Kalbar	76.96	88	23:16 10 Mar 10
6572	Warrill Ck at Harrisville	49.08	-	06:29 11 Mar 10
6652	Warrill Ck at Amberley (A)	28.42	-	17:04 11 Mar 10
6631	Warrill Ck at Amberley (B)	23.77	31	16:38 11 Mar 10
6581	Bremer R at Adams Bridge	78.86	80	01:22 11 Mar 10
6734	Bremer R at Rosewood	37.60	-	13:31 11 Mar 10
6551	Bremer R at Walloon (A)	OOA	-	-
6743	Bremer R at Walloon (B)	26.68	87	18:41 11 Mar 10
6740	Purga Ck at Washpool	OOA	-	-
2168	Bremer R at David Trumpy Br	-	-	-
Lower Brisbane River				
6755	Brisbane R at Moggill	-	-	-
6731	Brisbane R at Jindalee	-	-	-
6749	Brisbane R at Port Office	-	-	-
Pine River				
6712	North Pine R at Baxters Ck	-	-	-
6764	North Pine R at Petrie	0.92	-	06:43 11 Mar 10
6770	South Pine R at Drapers Xing	-	-	-

D805

This final event was the result of localised storm rainfalls which occurred directly over the reservoir of North Pine Dam.

Table 5.12: North Pine Dam – 10th March to 11th March 2010

Start EL (mAHD)	Start Capacity (ML)	Start Percentage (%)	End EL (mAHD)	End Capacity (ML)	End Percentage (%)	Inflow Volume (ML)	Release Volume (ML)
39.62	214,740	100.2	39.50	212,140	99.0	920	3,520

North Pine Dam peaked at a level of EL 39.627 m AHD at 22:05 on Wednesday 10th March 2010 with an estimated peak inflow of 88 m^3/s and a maximum release of 127 m^3/s. A plot of the estimated inflow and recorded release from North Pine Dam is shown in Figure B6 in Appendix B, whilst the recorded headwater level is presented as Figure C8 in Appendix C.

D806

6.0 DATA COLLECTION SYSTEM PERFORMANCE

6.1 NETWORK AVAILABILITY

Overall the Seqwater ERRTs (ALERT) network performed sufficiently during the flood events of February and March. Availability of sensors during the flood events was generally good for rainfall sensors, but less effective for stream height sensors with the following percentages recorded:

- Main Rainfall 7 OOA – 59 Total = 88.1% Available
- Back-up Rainfall 1 OOA – 11 Total = 87.5% Available
- Main Stream 13 OOA – 44 Total = 70.5% Available
- Back-up Stream 5 OOA – 12 Total = 58.3% Available

OOA = Out of Action on FLOOD-Col

6.2 RAINFALL

Rainfall sensors located upstream of the dams were generally available and provided sufficient representation of the event rainfall over the catchments of the dams. Sensors that were not available are listed below:

Main Rain

- 6565 Tenthill Ck at Tenthill
- 6606 West Woodbine
- 6619 Mt Castle
- 6568 O'Reillys Weir
- 6636 Wivenhoe Dam HW (A)
- 6649 Lowood (A)
- 6766 Lake Kurwongbah

D807

Back-up Rain

- 6653 Amberley (B)

Coverage of the upper Stanley River catchment is lacking and Seqwater are looking to expand the rainfall network in this region with new sites.

6.3 STREAM HEIGHT

Stream height sensors that were not available during the flood events include:

6.3.1 Main Stream

- 6709 Brisbane R at Devon Hills
- 6566 Tenthill Ck at Tenthill
- 6569 Lockyer Ck at O'Reillys Weir
- 6644 Brisbane R at Wivenhoe Dam TW (A)
- 6650 Brisbane R at Lowood (A)
- 6756 Brisbane R at Burtons Bridge
- 6757 Brisbane R at Kholo Bridge
- 6731 Brisbane R at Jindalee
- 6652 Warrill Ck at Amberley (A)
- 6790 Purga Ck at Washpool
- 6761 North Pine Dam HW (A)
- 6767 Lake Kurwongbah
- 6764 North Pine R at Petrie

D808

6.3.2 Back-up Stream

- 6592 Somerset Dam HW (C)
- 6638 Wivenhoe Dam HW (C)
- 6762 North Pine Dam HW (C)
- 6607 Brisbane R at Lowood (B)
- 6654 Warrill Ck at Amberley (B)

In addition to the sensors marked OOA, a number of sites were marked as 'Suspect' due to conflicting information with adjacent or back-up sites. These include sites such as:

- 6518 Brisbane R at Gregors Ck (B)
- 6703 Stanley R at Woodford (B)
- 6752 Brisbane R at Mt Crosby Weir (A)

6.3.3 Headwater Sensors

There were a number of concerns, especially related to headwater levels of the major storages and in particular the headwater gauge at Wivenhoe Dam. There are two sensors at Wivenhoe Dam, the main sensor 6637 and a 5m Druck (6638).

The headwater level sensor at Wivenhoe dam (6637) was found to be in error during the February flood event. This error, of up to 900 mm over estimation, was corrected at the end of February just prior to the early March flood event. However the gauge drifted again during this event and another correction was applied on the 8th March 2010 with another reduction of around 400mm.

The 5m Druck was Out Of Action for the entire event and so consequently manually read gauge board readings were the main source of level verification.

Two of the three headwater level sensors were also unavailable for North Pine Dam for a substantial part of the flood events. Again this provided little redundancy and a reliance on manually read information being provided from site.

D809

6.3.4 Sensor Calibration

Discrepancies were noted at a number of stream height sites during the event. The calibration parameters at some sites including Gregors Creek and Amberley were found to be incorrect resulting in elevated levels and flows being reported. These discrepancies were identified whilst comparing values with other agency published data including the BoM and DERM.

A review of all calibration data is recommended to ensure currency. A definitive calibration process that caters for both Environmon and FLOOD-Col should be utilized in reporting. Regular checks of calibration parameters are recommended at say nominally three to six monthly intervals.

6.3.5 Stream Height Rating Curves

The process outlined above also pointed to differences in adopted stream rating curves and it is recommended that rating curves at all sites be reviewed and updated with current versions. This should also be performed regularly. Rating curves of particular interest include:

- Brisbane R at Gregors Ck
- Stanley R at Woodford
- North Pine R at Baxters Creek

D810

7.0 DATA ANALYSIS PERFORMANCE

7.1 RUNOFF-ROUTING MODELS

It was noted during the modeling of flood event inflows that the WT42 model representation of North Pine Dam and to a lesser extent the models of Somerset Dam and Wivenhoe Dam, produce large initial inflows due to direct rainfall on the lake surface.

Estimated inflow hydrographs based upon this model configuration tend not to track against recorded lake levels when incorporated into the gate operations spreadsheet. An alternate model configuration whereby this direct runoff is routed and hence attenuated should be considered.

The modification of WT42 model calibration parameters was also discussed during the events as some models did not appear to simulate the recorded hydrographs particularly well. A summary of adopted calibration parameters is available in the documentation provided with the system and it is recommended that the DFOE familiarize themselves with the range of parameters derived from the calibrations.

URBs models developed by the BoM and utilized by Seqwater in association with Environmon were used during the flood events which resulted in some differences in inflow estimates. Running both systems (WT42 and URBs) in parallel is recommended during the development of the replacement system fro FLOOD.

7.2 BASEFLOW ASSESSMENT

As discussed in the flood operations strategies, modeling of base flow recessions has been somewhat ad hoc in the past and has relied on recorded lake levels as a guide. A more consistent modeling approach is suggested and some trialling of an approach was undertaken during the later March events involving North Pine Dam. The model trialled was of the form:

D811

Base Flow = ((Base Flow at t-1) x BR) + (BC x ((Model Calculated Inflow at t) ^ BM))

Where: t = Current time step

BR = Base Flow Recession Constant (~0.9 or less than unity)

BC = Surface Runoff Factor (~0.004)

BM = Power (~1.0)

The calculated base flow is then added to the estimated runoff-routing inflow of the same time step to provide the estimate of the total inflow. The total inflow can also be adjusted by a scale factor to ensure that overall volumetric balance is achieved.

D812

8.0 COMMUNICATIONS

8.1 EVENT LOG

It was determined at a post event de-brief that the Event Log needed to contain sufficient information to provide forensic information which is able to justify the adopted operational strategy. The DFOEs need to ensure that a consistent approach is adopted in recording all pertinent information used to formulate the gate operations strategy and to direct the operation at each dam.

Care is also required to ensure all data (digital and or hard copy) is stored in an appropriate and consistent way. To that end templates have been established on the FOC computers and communication protocols.

The use of email to communicate with site requires such messages to be logged in a similar way with fax and verbal conversations.

8.2 DECLARATION OF EVENT MOBILISATION

The declaration of an event and subsequent mobilization/de-mobilisation of operators to a dam has to be clear and there should be a distinct declaration when a dam moves from normal operational status to flood operation status.

During the February flood event the situation at Somerset Dam meant that the radial crest gates were not raised as part of the initial actions upon a flood event being declared. Somerset Dam was making operational releases at the time of mobilization and this situation was not addressed until later in the event.

It should be noted that at no time was the level in Somerset Dam expected to exceed the fixed crest level and therefore having the radial crest gates closed was not an issue.

D813

8.3 SHIFT HANDOVER

It was recommended that an event log book be utilized to assist in the handover process at the cessation of shifts. A summary of the operational status should be provided and this could form the basis of the event status report. These status reports should be provided to Rob Drury at Seqwater on a regular basis and accompanied by verbal confirmation.

D814

9.0 FLOOD MANAGEMENT STRATEGIES

9.1 16TH TO 18TH FEBRUARY 2010

9.1.1 North Pine Dam

The only dam to be mobilized during this event was North Pine Dam. Somerset Dam received inflows that caused the reservoir to rise by over 0.54 m and approach FSL. However, apart from monitoring the inflow, no gate operations were necessary.

Once the magnitude of the event at North Pine Dam was assessed and understood, the flood management strategy adopted for this event was aimed at minimizing the impact of releases on the low level crossings located downstream of the dam and also assisting in the fish recovery process.

North Pine Dam attained FSL at around 00:00 on Wednesday 17th February 2010. Moreton Bay Regional Council had previously been advised of the likelihood of gate operations and Young's Crossing was closed at around 22:00 on Tuesday evening 16th February.

Gate operations commenced at the gate trigger level of EL 39.65m AHD which occurred at 5:15 on Wednesday 17th February and the downstream crossings of Grant Street and Young's Crossing were inundated before the morning peak hour. Releases were increased above the minimum recommended gate settings so as to reduce the duration of gate operation. Initially it was estimated that the required gate release of 16 m^3/s would extend gate operations for a period of at least 48 hours. Additional gate openings allowed for this period to be reduced to some 27 hours.

At the conclusion of the event, North Pine Dam was drawn down to below FSL by 30mm so as to allow for the estimated baseflow. The adopted gate shutdown sequence was staggered in hourly increments and the resultant circulation pattern observed by the Seqwater fish recovery team. This was done to determine if modifications to the stream channel immediately downstream of the dam assisted in preventing stranding of fish on the recession.

D815

This closure sequence time interval was found to be satisfactory and it prevented large numbers of fish from being stranded. The low level release valve was also opened to release around 1 m^3/s to attract fish into the channel located within the deepened downstream reach.

The gate settings adopted for North Pine Dam are shown in Table 9.1. Figure B2 shows the estimated inflow and release from the dam, whilst Figure C3 shows the recorded headwater level.

D816

Table 9.1: North Pine Dam Gate Settings – 17th to 18th February 2010

Date & Time	Lake Level (mAHD)	Gate Setting					Flow (m^3/s)
		A	B	C	D	E	
17/2 5:15	39.650	0	0	1	0	0	16
17/2 8:00	39.663	0	0	1	0	1	32
17/2 9:00	39.664	1	0	1	0	1	48
17/2 14:00	39.637	0	0	1	0	1	32
18/2 00:20	39.614	1	0	1	0	1	48
18/2 07:00	39.573	0	0	1	0	1	33*
18/2 08:00	39.573	0	0	1	0	1	17*
18/2 09:00	39.570	0	0	0	0	0	1*

* Release from low level outlet valve to assist with fish recovery.

9.2 26TH FEBRUARY TO 4TH MARCH

9.2.1 Somerset and Wivenhoe Dam

Seqwater commenced operational releases from Somerset Dam on Wednesday 24th February 2010 at 9:30 as the lake level was just below FSL at EL 98.87 m AHD. These releases were instigated to draw down the storage in Somerset Dam as Wivenhoe Dam was still at a relatively low level (around 61% capacity). Initially the objective of these releases was to draw Somerset Dam down to approximately EL 98.0 m AHD or about 90% of capacity.

However, event rainfalls resulted in operators at Somerset Dam being mobilised for flood operations at 9:00 on Monday 1st March 2010. The lake level at this time was EL 98.62 m AHD and rising with one cone valve open 100%. The dam was releasing at a rate of 68 m^3/s or 5,875 ML/day.

D817

There is no formal record of Somerset Dam being mobilised in the FOC Flood Log and no record of an instruction to open the radial crest gates at this time. As a result, the radial crest gates remained closed at this time.

Initial assessment of the flood magnitude suggested that Somerset Dam was expected to exceed FSL (EL99.0 m AHD) and that Wivenhoe Dam was not expected to reach FSL (EL 67.0 m AHD). Therefore, Strategy S1 of the Somerset Dam flood operation procedures was implemented. The objective of this strategy is to return the reservoir to FSL, whilst minimizing the impact on rural life upstream of the dam. The radial crest gates should raised to enable uncontrolled discharge, whilst regulator valves and sluice gates are to be used to maintain the level in Somerset dam below EL102.0 m AHD. The release rate from Somerset Dam is not to exceed the peak inflow into the dam.

Somerset Dam attained FSL at 6:45 on Tuesday 2nd March 2010 and as a consequence, opening of the remaining regulator cone valves commenced. All four regulator cone valves were fully opened by 18:00 that afternoon with the dam releasing 276 m^3/s. The lake level was EL99.32 m AHD and rising. Opening of sluice gates commenced at 21:00 in an attempt to arrest the rising reservoir level in order to minimize the upstream impacts. Sluices L, M and N were eventually opened. Sluice N was opened in preference to Sluice K because of maintenance preferences.

Somerset Dam peaked at EL 99.45 m AHD at around 22:00 on Tuesday 2nd March 2010. The maximum release rate of 885 m^3/s occurred at 03:00 on the morning of Wednesday 3rd March 2010. This release was larger than the peak inflow of around 700 m^3/s, although at the time of the peak release the estimated inflow was estimated to be 900 m^3/s. This estimate was reduced later in the event when there was more confidence in the rainfall on the ground and the volumetric water balance.

Sluice gate releases continued until 17:00 on Wednesday 3rd March 2010. Somerset Dam operators were de-mobilised at 21:00 on Wednesday 3rd March 2010, but operational releases through the regulator cone valves continued until 6:30 on Thursday 18th March 2010.

D818

The radial crest gates were opened on Sunday 7th March 2010, after it was recognized that the initial action procedure had not been adhered to. These gates were then shut when the regulator cone valve releases were terminated.

Operators at Wivenhoe Dam were not formally mobilized during this event, but as the lake level rose substantially daily monitoring of the reservoir was undertaken. Releases from Somerset Dam were tapered towards the end of the event as estimates of the inflow volume into Wivenhoe Dam were revised and the reservoir approached FSL.

Gate settings adopted for Somerset Dam are summarized in Table 9.2.

Table 9.2: Somerset Dam gate Settings – 24th February 18th March

Date & Time	Sluice Gate Setting (Open -1)								Sluice Flow (m^3/s)	Cone Valve Setting (%)				Cone Flow (m^3/s)	Total Flow (m^3/s)
	I	J	K	L	M	N	O	P		2	3	12	13		
24/2 06:30	-	-	-	-	-	-	-	-	0	-	-	-	-	0	0
24/2 09:30	-	-	-	-	-	-	-	-	0	-	20	-	-	16	16
26/2 12:30	-	-	-	-	-	-	-	-	0	-	100	-	-	68	68
2/3 06:45	-	-	-	-	-	-	-	-	0	100	-	-	100	136	136
2/3 08:30	-	-	-	-	-	-	-	-	0	100	-	100	100	207	207
2/3 18:00	-	-	-	-	-	-	-	-	0	100	100	100	100	276	276
2/3 21:00	-	-	-	1	-	-	-	-	203	100	100	100	100	276	479
3/3 00:00	-	-	-	1	1	-	-	-	406	100	100	100	100	276	682
3/3 03:00	-	-	-	1	1	1	-	-	609	100	100	100	100	276	885
3/3 12:20	-	-	-	1	1	-	-	-	406	100	100	100	100	276	682
3/3 15:00	-	-	-	1	-	-	-	-	203	100	100	100	100	276	479
3/3 18:00	-	-	-	-	-	-	-	-	0	100	100	100	100	276	276
5/3 11:00	-	-	-	-	-	-	-	-	0	100	100	100	-	204	204
5/3/14:00	-	-	-	-	-	-	-	-	0		100	100	-	136	136
6/3 18:15	-	-	-	-	-	-	-	-	0	100	100	100	-	204	204

D819

7/3 06:30	-	-	-	-	-	-	-	-	0	100	100	100	100	276	276
8/3 06:30	-	-	-	-	-	-	-	-	0	100	100	100	-	204	204
8/3 09:00	-	-	-	-	-	-	-	-	0	-	100	100	-	136	136
8/3 14:30	-	-	-	-	-	-	-	-	0	-	100	-	-	68	68
8/3 16:00	-	-	-	-	-	-	-	-	0	-	-	-	-	0	0
9/3 15:15	-	-	-	-	-	-	-	-	0	-	10	-	-	7	7
11/3 10:00	-	-	-	-	-	-	-	-	0	-	-	-	100	68	68
13/3 06:30	-	-	-	-	-	-	-	-	0	-	-	-	5	4	4
14/3 06:30	-	-	-	-	-	-	-	-	0	-	-	-	10	7	7
16/3 06:30	-	-	-	-	-	-	-	-	0	-	-	-	50	34	34
18/3 06:30	-	-	-	-	-	-	-	-	0	-	-	-	-	0	0

Shading indicates operational releases, whilst un-shaded area indicates formal flood operations.

Figure B3 shows the estimated inflow and release from Somerset Dam and Wivenhoe Dam, whilst Figures C4 and C5 show the recorded headwater levels.

9.2.2 North Pine Dam

The gate settings adopted for North Pine Dam are shown in Table 9.3. Figure B4 shows the estimated inflow and release from the dam, whilst Figure C6 shows the recorded headwater level.

The minimum gate settings as indicated in the *Manual of Operational Procedures for Flood Releases from North Pine Dam Version 4, (Seqwater Sept 2007)* were adopted on the rising limb of the flood. The minimum gate opening interval of 15 minutes was also observed. Once the magnitude of the event at North Pine Dam was assessed and understood, the flood management strategy adopted for this event was aimed at minimizing the impact of releases on the low level crossings located downstream of the dam and also assisting in the fish recovery process.

D820

To this end the drainage phase of the releases were modified in an effort to reduce the period of time that the low level crossing were inundated. Additional gate settings were utilized to drain the flood storage faster than that indicated in the Manual.

In view of the success of the modified channel works downstream of the spillway, a faster closure sequence was also adopted during the flood recession. Minimum gate closure intervals (15 minutes) were adopted in lieu of the hourly intervals adopted in the previous event. Reports form the fish recovery team indicated that this sequencing worked and that minimal numbers of fish were stranded during the closure process.

Table 9.3: North Pine Dam Gate Settings – 1st to 4th March 2010

Date & Time	Lake Level (mAHD)	Gate Setting					Flow (m^3/s)
		A	B	C	D	E	
1/3 18:00	39.650	-	-	-	-	-	0
1/3 18:35	39.660	-	-	1	-	-	16
1/3 22:00	39.700	-	-	1	-	1	32
2/3 00:15	39.715	1	-	1	-	1	48
2/3 01:10	39.730	1	-	1	1	1	64
2/3 02:10	39.753	1	1	1	1	1	81
2/3 02:35	39.758	1	1	2	1	1	105
2/3 04:10	39.780	1	1	2	1	2	129
2/3 04:35	39.788	2	1	2	1	2	153
2/3 06:35	39.805	2	1	2	2	2	177
2/3 07:30	39.820	2	2	2	2	2	202
2/3 11:30	39.840	2	2	3	2	2	238
2/3 17:45	39.870	2	2	3	2	3	254
2/3 18:00	39.873	3	2	3	2	3	281
2/3 19:45	39.901	3	2	3	3	3	307
2/3 20:00	39.899	3	3	3	3	3	334

D821

2/3 21:40	39.910	3	3	4	3	3	361
3/3 01:00	39.880	3	3	3	3	3	334
3/3 02:00	39.866	3	2	3	3	3	307
3/3 02:45	-	3	2	3	2	3	280
3/3 03:15	-	2	2	3	2	3	254
3/3 03:30	39.839	2	2	3	2	2	228
3/3 05:00	39.820	2	2	2	2	2	202
3/3 06:00	39.805	2	1	2	2	2	177
3/3 07:30	39.780	2	1	2	1	2	153
3/3 10:00	39.770	1	1	2	1	2	129
3/3 12:00	39.760	1	1	2	1	1	105
3/3 19:15	39.740	1	1	2	1	2	129
3/3 20:15	39.730	2	1	2	1	2	152
4/3 02:15	39.660	2	1	2	2	2	176
4/3 06:30	39.569	2	1	2	1	2	151
4/3 08:15	39.538	1	1	2	1	2	127
4/3 08:30	39.535	1	1	2	1	1	103
4/3 08:45	39.537	1	1	1	1	1	81*
4/3 09:45	39.529	1	-	1	1	1	65*
4/3 10:00	39.522	1	-	1	-	1	49*
4/3 11:00	39.524	-	-	1	-	1	33*
4/3 11:15	39.522	-	-	1	-	-	17*
4/3 11:30	39.526	-	-	-	-	-	1*

* Release from low level outlet valve to assist with fish recovery.

Moreton Bay Regional Council were able to open Young's Crossing in time for the afternoon peak hour.

D822

The low level release valve was kept open to assist in fish attraction and also in draining the baseflow.

At the conclusion of the event, North Pine Dam was drawn down to below FSL by 70mm so as to allow for the estimated baseflow. A compromise is required in the closure sequence objectives. The DFOE needs to consider reducing the impact on the downstream crossings (i.e. close the gates quickly) and also accommodating continuing baseflows. The estimation of baseflow has been based upon recorded recessions and consideration is being given to improving modeling in order to provide better estimates for use in determining appropriate closure sequences.

9.3 4TH MARCH TO 7TH MARCH

9.3.1 North Pine Dam

North Pine Dam lake levels rebounded from EL39.53 m AHD following the previous gate operations. By 07:00 on Friday 5th March 2010 the lake level was EL 39.61 m AHD, above FSL. The BoM were predicting further showers and storms and the QPF indicted 10 to 20 mm with isolated falls of between 20 and 40 mm.

The FOC and North Pine Dam were mobilised on Friday afternoon with the intention of closing Young's Crossing during the evening, after the afternoon peak hour. Moreton Bay Regional Council was advised of the proposed operations and initial procedures were completed at the dam.

The gate trigger level of EL 39.65 m AHD was attained at 18:30 on Friday 5th March 2010. Gate operations commenced shortly after at 19:30. This event commenced as a drainage exercise and as a consequence additional gate openings were undertaken to reduce the duration of the impact on the low level crossings. The objective of the release was to drain the lake level down to around EL 39.53 m AHD (70 mm below FSL) to provide sufficient buffer to deal with the ongoing baseflows. It was anticipated that the low level crossings would be opened again for traffic by Saturday morning.

D823

Operations were conducted in accordance with this strategy and the last gate was closed at 07:00 on Saturday 6th March 2010. The lake level was drawn down to EL39.52 m AHD and consequently the FOC and North Pine Dam were de-mobilised.

Little of the forecast rainfall had fallen over the catchment on Friday evening, but rainfall did increase during daylight hours on Saturday. This rainfall resulted in the lake level rebounding quickly to FSL by around 18:00 on Saturday 6th March 2010.

As it was evident that the lake level would exceed the gate trigger level, the FOC and North Pine Dam were re-mobilised at 17:30 on Saturday 6th March 2010.

The event was again considered a drainage exercise as inflows from the rainfall effectively amplified the runoff that was previously occurring as baseflow. In acknowledgement of the elevated baseflow, it was decided to drain the storage to a lower level than previous so that the lake level would remain below FSL at the conclusion of releases. A target level of EL 39.4 m AHD was nominally adopted, providing 200mm of storage deficit.

The gate settings adopted for North Pine Dam are shown in Table 9.4. Figure B5 shows the estimated inflow and release from the dam, whilst Figure C7 shows the recorded headwater level.

Table 9.4: North Pine Dam Gate Settings – 5th to 7th March 2010

Date & Time	Lake Level (mAHD)	Gate Setting					Flow (m^3/s)
		A	B	C	D	E	
5/3 18:30	39.650	-	-	-	-	-	0
5/3 19:30	39.657	-	-	1	-	-	16
5/3 20:00	39.653	-	-	1	-	1	32
5/3 20:15	39.651	1	-	1	-	1	48
5/3 20:30	39.651	1	-	1	1	1	64
5/3 21:15	39.647	1	1	1	1	1	80
5/3 22:45	39.638	1	1	2	1	1	104
5/3 23:00	39.630	1	1	2	1	2	128

D824

5/3 23:15	39.630	2	1	2	1	2	152
6/3 02:45	39.545	1	1	2	1	2	127
6/3 03:00	39.545	1	1	2	1	1	103
6/3 03:30	39.538	1	1	1	1	1	80
6/3 05:30	39.525	1	-	1	1	1	64
6/3 05:45	39.525	1	-	1	-	1	48
6/3 06:15	-	-	-	1	-	1	33*
6/3 06:45	-	-	-	1	-	-	17*
6/3 07:00	39.534	-	-	-	-	-	1*
6/3 19:00	-	-	-	-	-	-	1*
6/3 19:15	39.607	-	-	1	-	-	16
6/3 19:30	39.606	-	-	1	-	1	32
6/3 19:45	39.609	1	-	1	-	1	48
6/3 20:00	39.613	1	-	1	1	1	64
6/3 20:15	39.614	1	1	1	1	1	80
6/3 21:30	39.619	1	1	2	1	1	103
6/3 21:45	39.617	1	1	2	1	2	127
6/3 22:00	39.615	2	1	2	1	2	151
7/3 07:45	39.474	1	1	2	1	2	126
7/3 08:15	39.468	1	1	2	1	1	103
7/3 10:00	39.452	1	1	1	1	1	79
7/3 10:30	39.448	1	-	1	1	1	63
7/3 11:00	39.447	1	-	1	-	1	47
7/3 15:40	39.447	-	-	1	-	1	33*
7/3 15:55	39.445	-	-	1	-	-	17*
7/3 16:10	39.444	-	-	-	-	-	1*

* Release from low level outlet valve to assist with fish recovery.

D825

9.4 10TH MARCH TO 11TH MARCH

9.4.1 North Pine Dam

The lake level in North Pine Dam had rebounded to EL 39.59 m AHD by 09:00 on Wednesday 10th March 2010. The QPF for rainfall in the following 24 hours was less than 5mm, but isolated thunderstorms were predicted for the South-East.

Some very localized but severe storm cells developed around Thornton and also Petrie at approximately 17:00 on Wednesday 10th March 2010. The storm cell at Petrie resulted in 37 and 22 mm of rain falling in around 30 minutes at Lake Kurwongbah and Strathpine respectively. Rainfall also fell directly upon the reservoir of North Pine Dam causing the lake level to rise suddenly to EL 39.621 m AHD at 19:35.

The FOC and North Pine Dam were mobilized at 20:00 with gate operations planned to commence at 22:00 on Wednesday 10th March 2010. Moreton Bay Regional Council were advised of the requirement to close Young's Crossing.

As with the previous event, the operations were treated as a drainage exercise with the objective of minimizing impacts on the low level crossings. A target level of EL39.5 m AHD (100mm storage deficit) was adopted as the cut-off point for the operations, with the intention of bringing the low level crossing out of water for traffic by the Thursday afternoon peak hour.

The gate settings adopted for North Pine Dam are shown in Table 9.5. Figure B6 shows the estimated inflow and release from the dam, whilst Figure C8 shows the recorded headwater level.

D826

Table 9.5: North Pine Dam Gate Settings – 10th to 11th March 2010

Date & Time	Lake Level (mAHD)	Gate Setting					Flow (m^3/s)
		A	B	C	D	E	
10/3 20:00	39.624	-	-	-	-	-	0
10/3 22:05	39.627	-	-	1	-	-	16
10/3 22:20	39.626	-	-	1	-	1	32
10/3 22:35	39.625	1	-	1	-	1	48
10/3 22:50	39.623	1	-	1	1	1	64
10/3 23:05	39.621	1	1	1	1	1	80
10/3 23:30	39.615	1	1	2	1	1	103
10/3 23:45	39.614	1	1	2	1	2	127
11/3 03:15	39.552	1	1	2	1	1	103
11/3 03:30	39.546	1	1	1	1	1	80
11/3 08:00	-	1	-	1	1	1	64
11/3 08:15	-	1	-	1	-	1	48
11/3 08:30	-	-	-	1	-	1	33*
11/3 08:45	-	-	-	1	-	-	17*
11/3 09:00	39.496	-	-	-	-	-	1*

* Release from low level outlet valve to assist with fish recovery.

D827

10.0 RECOMMENDATIONS & CONCLUSIONS

10.1 DATA COLLECTION

The Seqwater ALERT network generally preformed adequately during the flood events that occurred in February and March 2010. Rainfall coverage was good, although additional stations located in the Stanley and Upper Brisbane River catchments would benefit the estimation of runoff in those areas. The major concern regarding stream height stations involved the performance of the headwater gauges. It is strongly recommended that the situation at Wivenhoe Dam be upgraded and that shaft encoders be utilized for each of the headwater stations.

Regular checks on the calibration parameters of stream height sensors is recommended at intervals of say three to six months.

Also it is recommended that stream height rating curves be checked for currency prior to each wet season.

10.2 DATA ANALYSIS

The runoff-routing models incorporated in FLOOD-Ops preformed within expectation, although a review of the calibration parameters is recommended. The treatment of direct rainfall on the reservoirs proved to be a concern especially with the North Pine Dam model. Consideration of modifying this representation should be given.

The development of a consistent approach to accounting for base flow is recommended. The incorporation of base flow especially in estimates derived for North Pine Dam is considered a priority given the operational constraints resulting from the low level crossings and fish rescue requirements at this site.

10.3 DIRECTIVES AND STATUS REPORTS

A consistent approach to recording and issuing of flood directives and event status reports is recommended to assist in ensuring that procedures are followed and that all parties are well informed of the operational strategy and planned operations.

D828

The use of template directories, common naming protocols and prepared document templates should assist in the organisation of this information. DFOE need to ensure that the team is disciplined in documenting and recording any relevant operational decisions.

10.4 OPERATIONAL STRATEGIES

The closure sequence at North Pine Dam proved to be the most problematic issue during the flood events. The selection of gate closure intervals and the drawdown target level remains sensitive, and as was demonstrated during the early March events can lead to repeated gate operations, if the estimates of base flow are not correctly taken into consideration. The adoption of a more gradual shut down sequence which is commensurate with the base flow recession is recommended. The timing of the closure sequence is also intrinsically linked to the drawdown target level which is nominally suggested at 50 to 100 mm below FSL.

The use of Strategy S1 for the determination of Somerset Dam gate openings was considered appropriate. There is some uncertainty associated with the accurate estimation of peak inflows especially early in the event when forecast rainfall is used in conjunction with recorded rainfall. This may influence the magnitude of the release and result in the peak release being larger than the actual peak inflow.

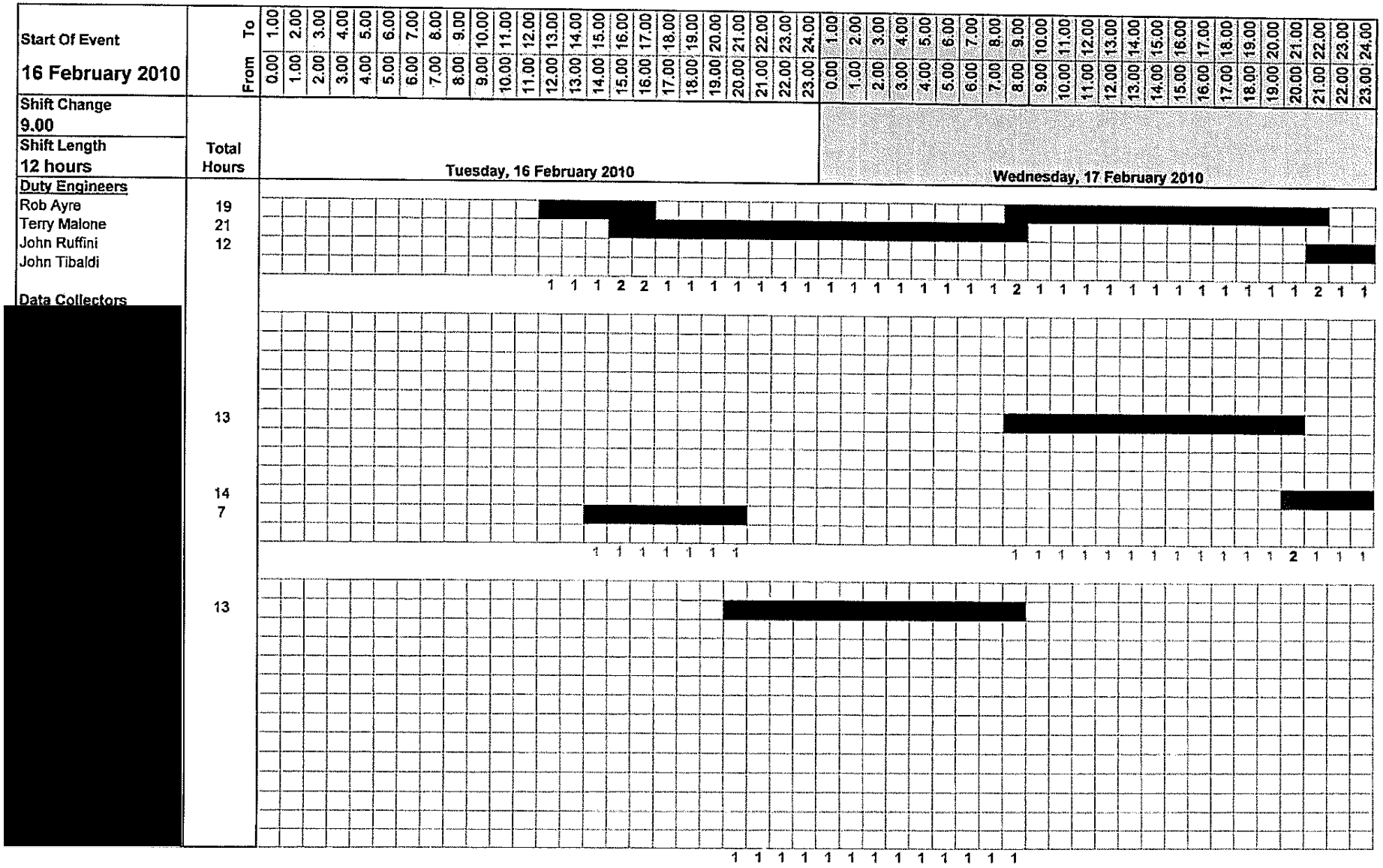
D829

APPENDIX A

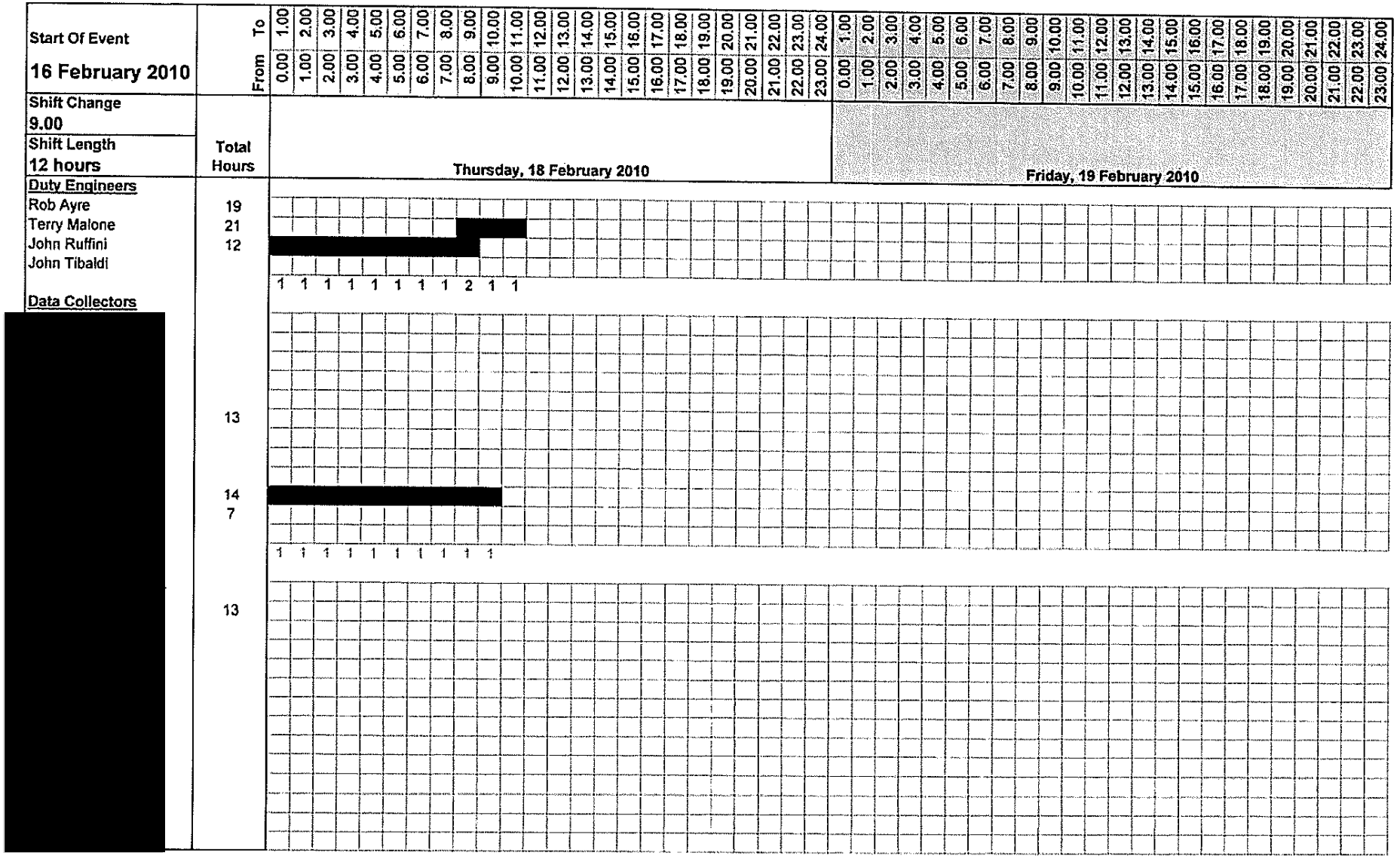
FOC ATTENDANCE LOGS & EVENT LOG

- FOC Attendance February 2010
  - Event Log February 2010
- FOC Attendance 1st March 2010
  - Event Log 1st March 2010
- FOC Attendance 5th March 2010
  - Event Log 5th March 2010
- FOC Attendance 10th March 2010
  - Event Log 10th March 2010

SEQWater Duty Roster for FLOOD EVENT



SEQWater Duty Roster for FLOOD EVENT



SEQWater Duty Roster for FLOOD EVENT

Start Of Event	To / From	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
16 February 2010		0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00
Shift Change																																																	
9.00																																																	
Shift Length	**Total Hours**																																																
12 hours																																																	
		Saturday, 20 February 2010																								**Sunday, 21 February 2010**																								
Duty Engineers																																																	
Rob Ayre	19																																																
Terry Malone	21																																																
John Ruffini	12																																																
John Tibaldi																																																	
Data Collectors																																																	
[redacted]	13																																																
	14																																																
	7																																																
	13																																																

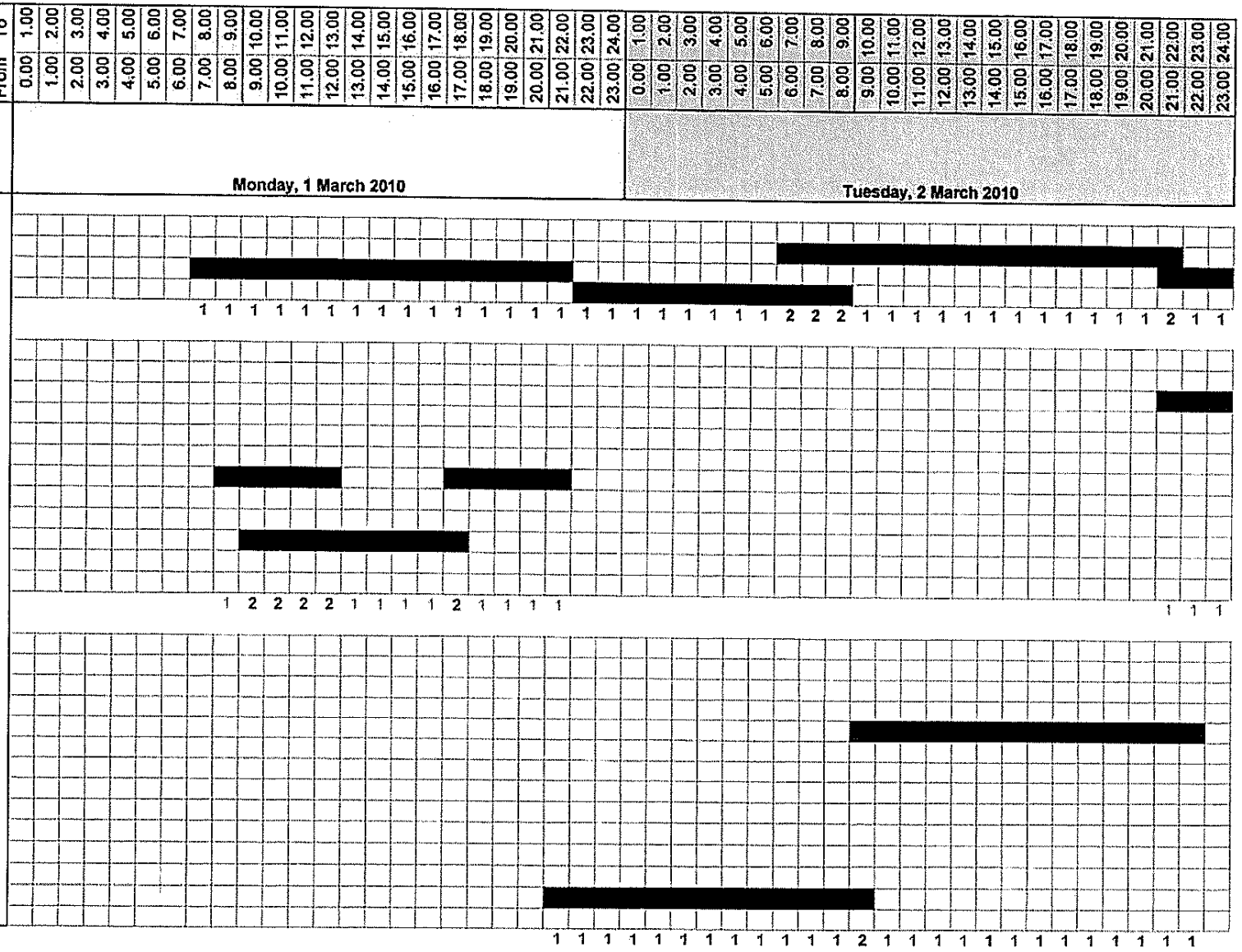
SEQWater Duty Roster for FLOOD EVENT

Start Of Event
1 March 2010

Shift Change
9.00

Shift Length
12 hours

	Total Hours
Duty Engineers	
Rob Ayre	
Terry Malone	35
John Ruffini	28
John Tibaldi	25
Data Collectors	
[redacted]	
	13
	10
	7
	9
	5
	12
	14
	13



SEQWater Duty Roster for FLOOD EVENT

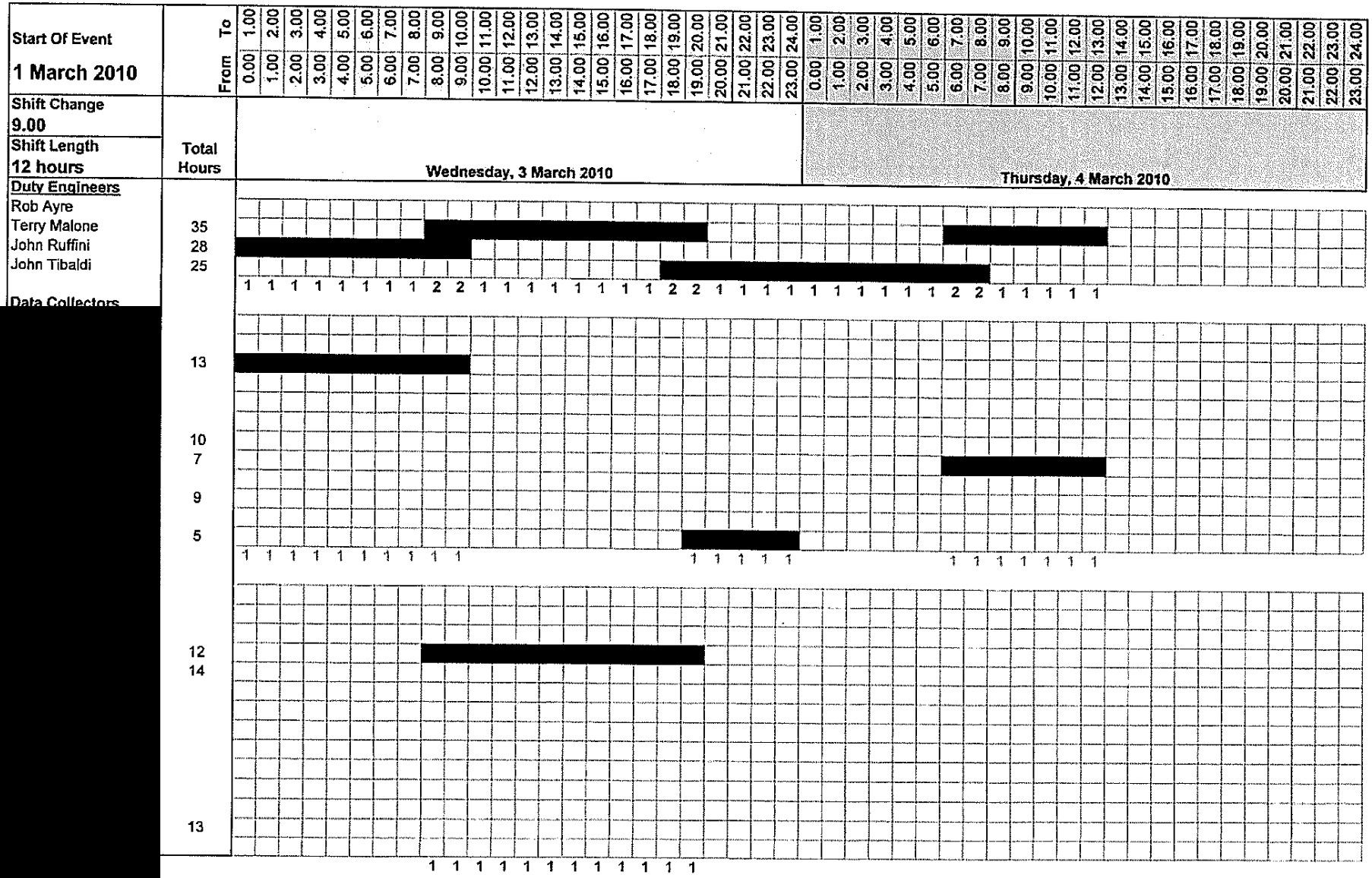
Start Of Event
1 March 2010

Shift Change
9.00

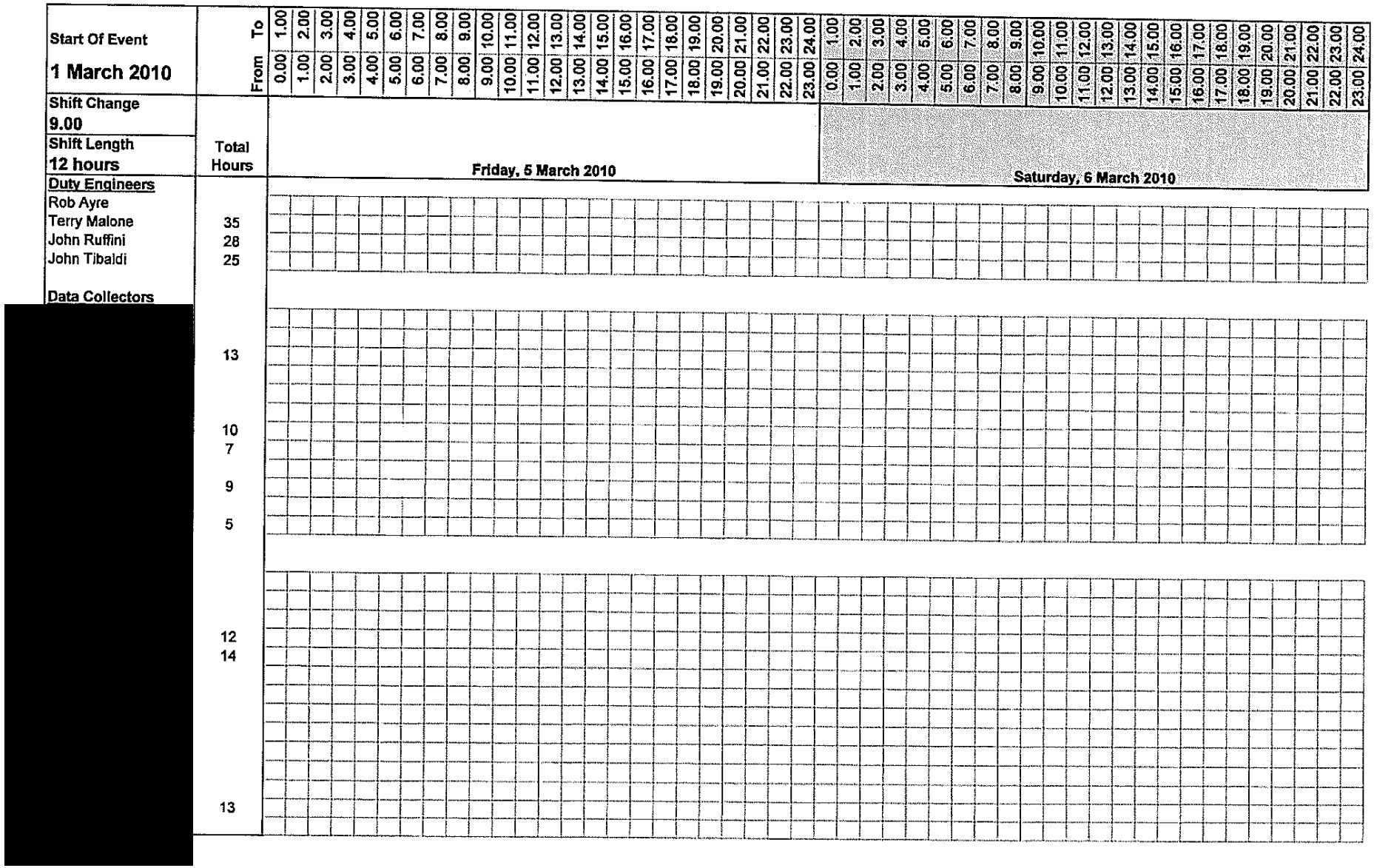
Shift Length
12 hours

Duty Engineers
Rob Ayre
Terry Malone
John Ruffini
John Tibaldi

Data Collectors
[redacted]



SEQWater Duty Roster for FLOOD EVENT

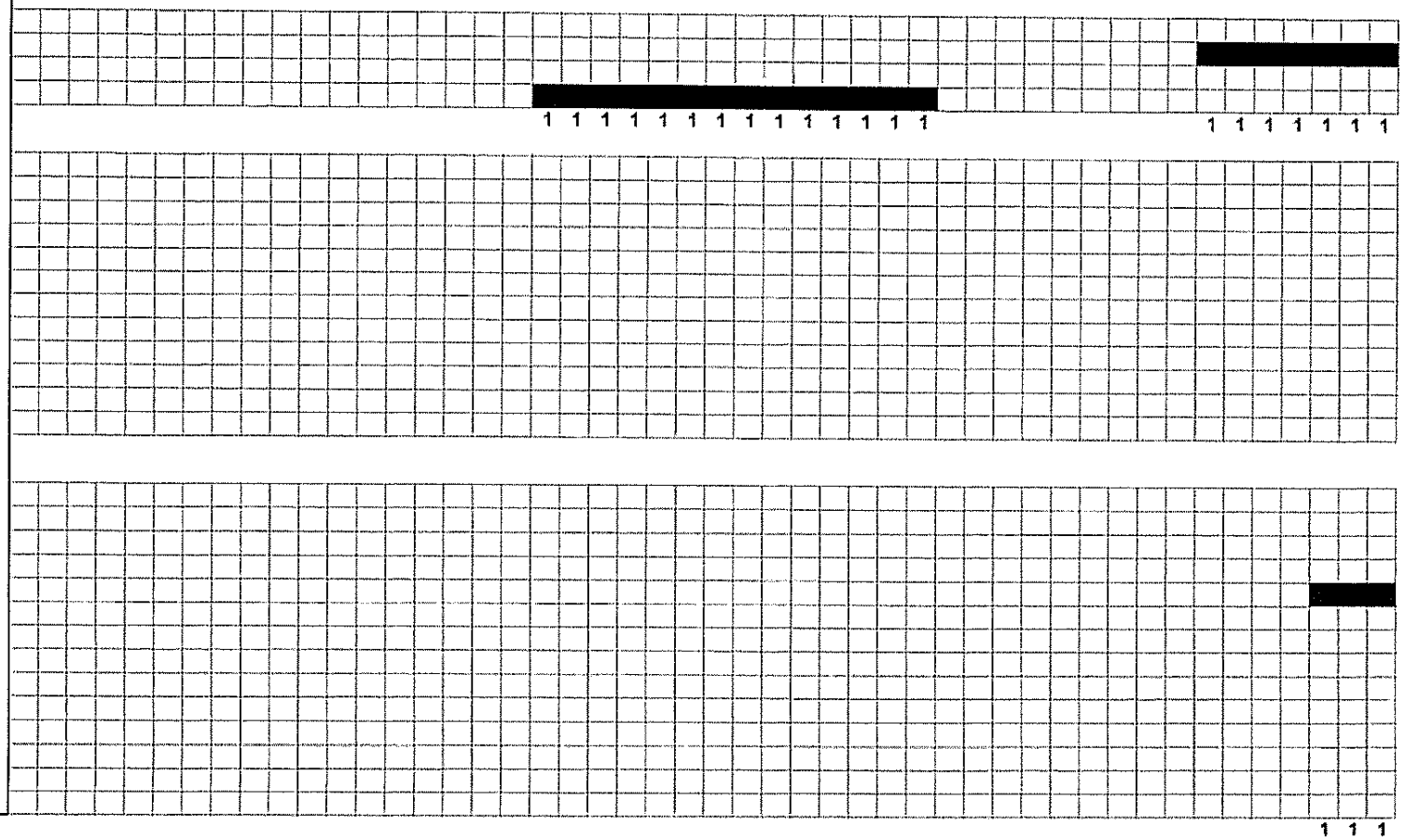


SEQWater Duty Roster for FLOOD EVENT

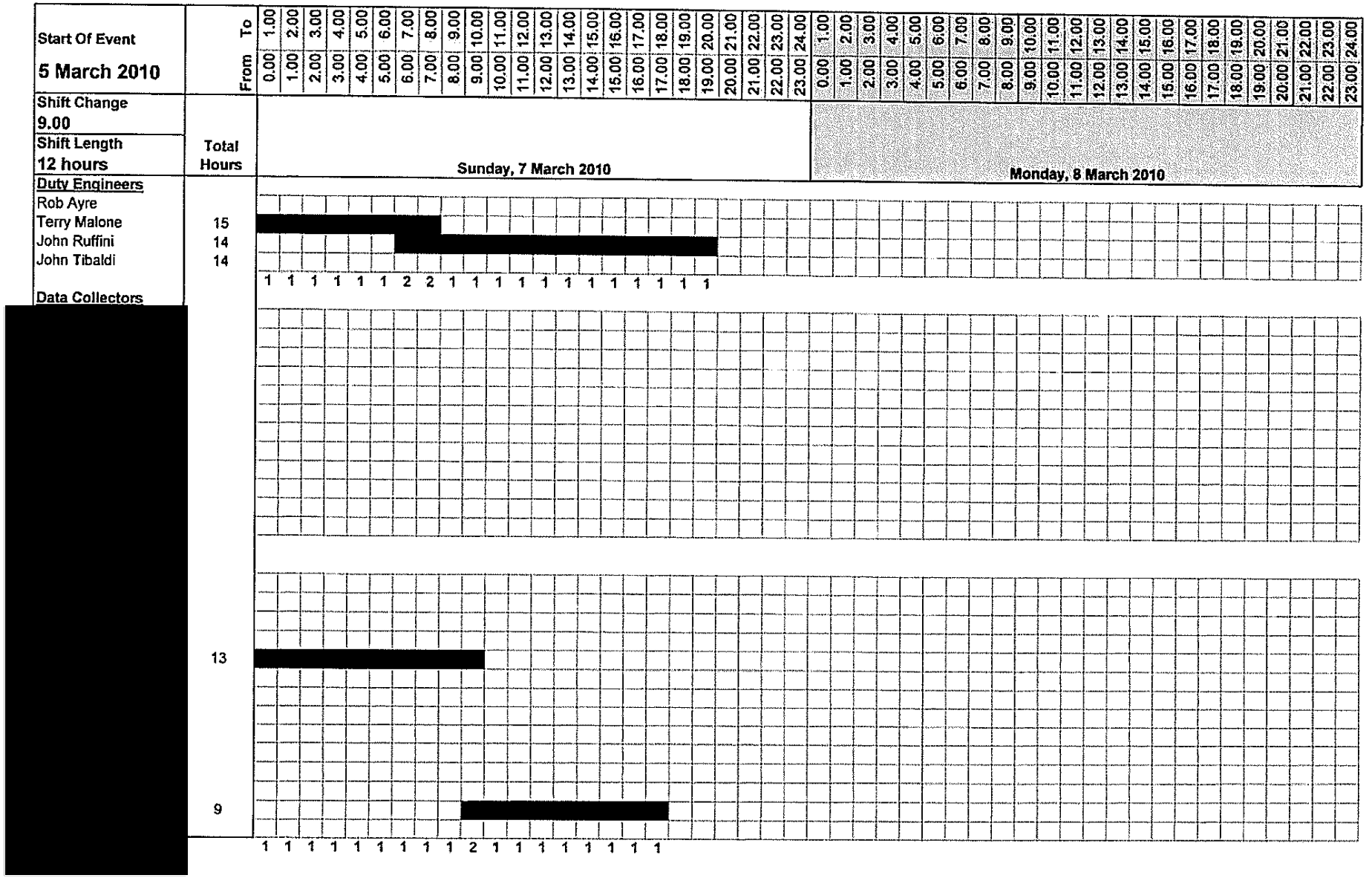
Start Of Event		From	To
5 March 2010		0.00	1.00
Shift Change		1.00	2.00
9.00		2.00	3.00
Shift Length		3.00	4.00
12 hours	Total Hours	4.00	5.00
Duty Engineers		5.00	6.00
Rob Ayre		6.00	7.00
Terry Malone	15	7.00	8.00
John Ruffini	14	8.00	9.00
John Tibaldi	14	9.00	10.00
Data Collectors		10.00	11.00
[redacted]		11.00	12.00
		12.00	13.00
		13.00	14.00
		14.00	15.00
		15.00	16.00
		16.00	17.00
		17.00	18.00
		18.00	19.00
		19.00	20.00
		20.00	21.00
		21.00	22.00
		22.00	23.00
		23.00	24.00
		0.00	1.00
		1.00	2.00
		2.00	3.00
		3.00	4.00
		4.00	5.00
		5.00	6.00
		6.00	7.00
		7.00	8.00
		8.00	9.00
		9.00	10.00
		10.00	11.00
		11.00	12.00
		12.00	13.00
		13.00	14.00
		14.00	15.00
		15.00	16.00
		16.00	17.00
		17.00	18.00
		18.00	19.00
		19.00	20.00
		20.00	21.00
		21.00	22.00
		22.00	23.00
		23.00	24.00

Friday, 5 March 2010 | Saturday, 6 March 2010

Duty Engineers	Total Hours
Rob Ayre	
Terry Malone	15
John Ruffini	14
John Tibaldi	14
Data Collectors	
[redacted]	
	13
	9



SEQWater Duty Roster for FLOOD EVENT



SEQWater Duty Roster for FLOOD EVENT

Start Of Event		To	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
5 March 2010		From	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00
Shift Change																																																			
9.00																																																			
Shift Length	**Total Hours**																																																	
12 hours																																																		
			Tuesday, 9 March 2010																												**Wednesday, 10 March 2010**																							
Duty Engineers																																																		
Rob Ayre	15																																																	
Terry Malone	14																																																	
John Ruffini	14																																																	
John Tibaldi																																																		
Data Collectors																																																		
[redacted]	13																																																	
	9																																																	

SEQWater Duty Roster for FLOOD EVENT

Start Of Event	Total Hours	Wednesday, 10 March 2010																								Thursday, 11 March 2010																							
10 March 2010	From / To	0.00 1.00	1.00 2.00	2.00 3.00	3.00 4.00	4.00 5.00	5.00 6.00	6.00 7.00	7.00 8.00	8.00 9.00	9.00 10.00	10.00 11.00	11.00 12.00	12.00 13.00	13.00 14.00	14.00 15.00	15.00 16.00	16.00 17.00	17.00 18.00	18.00 19.00	19.00 20.00	20.00 21.00	21.00 22.00	22.00 23.00	23.00 24.00	0.00 1.00	1.00 2.00	2.00 3.00	3.00 4.00	4.00 5.00	5.00 6.00	6.00 7.00	7.00 8.00	8.00 9.00	9.00 10.00	10.00 11.00	11.00 12.00	12.00 13.00	13.00 14.00	14.00 15.00	15.00 16.00	16.00 17.00	17.00 18.00	18.00 19.00	19.00 20.00	20.00 21.00	21.00 22.00	22.00 23.00	23.00 24.00
Shift Change 9.00																																																	
Shift Length 12 hours																																																	
Duty Engineers																																																	
Rob Ayre	12																																																
Terry Malone																																																	
John Ruffini																																																	
John Tibaldi	6																																																
[redacted]																					1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1											
	9																																																
																								1	1	1	1	1	1	1	1	1																	

T:\Asset Solutions\Ext-SEQWater\P-AEXP-1802-AK-01-03 SEQWater Flood Management Services\Reports\Event-Mar2010\AppendixA\Seqwater Event Roster 10Mar10.xls 11:18 AM 24/06/2010

SEQWater Duty Roster for FLOOD EVENT

Start Of Event 10 March 2010	To / From	1.00 / 0.00	2.00 / 1.00	3.00 / 2.00	4.00 / 3.00	5.00 / 4.00	6.00 / 5.00	7.00 / 6.00	8.00 / 7.00	9.00 / 8.00	10.00 / 9.00	11.00 / 10.00	12.00 / 11.00	13.00 / 12.00	14.00 / 13.00	15.00 / 14.00	16.00 / 15.00	17.00 / 16.00	18.00 / 17.00	19.00 / 18.00	20.00 / 19.00	21.00 / 20.00	22.00 / 21.00	23.00 / 22.00	24.00 / 23.00	1.00 / 0.00	2.00 / 1.00	3.00 / 2.00	4.00 / 3.00	5.00 / 4.00	6.00 / 5.00	7.00 / 6.00	8.00 / 7.00	9.00 / 8.00	10.00 / 9.00	11.00 / 10.00	12.00 / 11.00	13.00 / 12.00	14.00 / 13.00	15.00 / 14.00	16.00 / 15.00	17.00 / 16.00	18.00 / 17.00	19.00 / 18.00	20.00 / 19.00	21.00 / 20.00	22.00 / 21.00	23.00 / 22.00	24.00 / 23.00
Shift Change 9.00																																																	
Shift Length 12 hours	Total Hours	Friday, 12 March 2010																								Saturday, 13 March 2010																								
Duty Engineers																																																
Rob Ayre	12																																																
Terry Malone																																																	
John Ruffini																																																	
John Tibaldi	6																																																
Data Collectors																																																	
[redacted]	9																																																

SEQWater Duty Roster for FLOOD EVENT

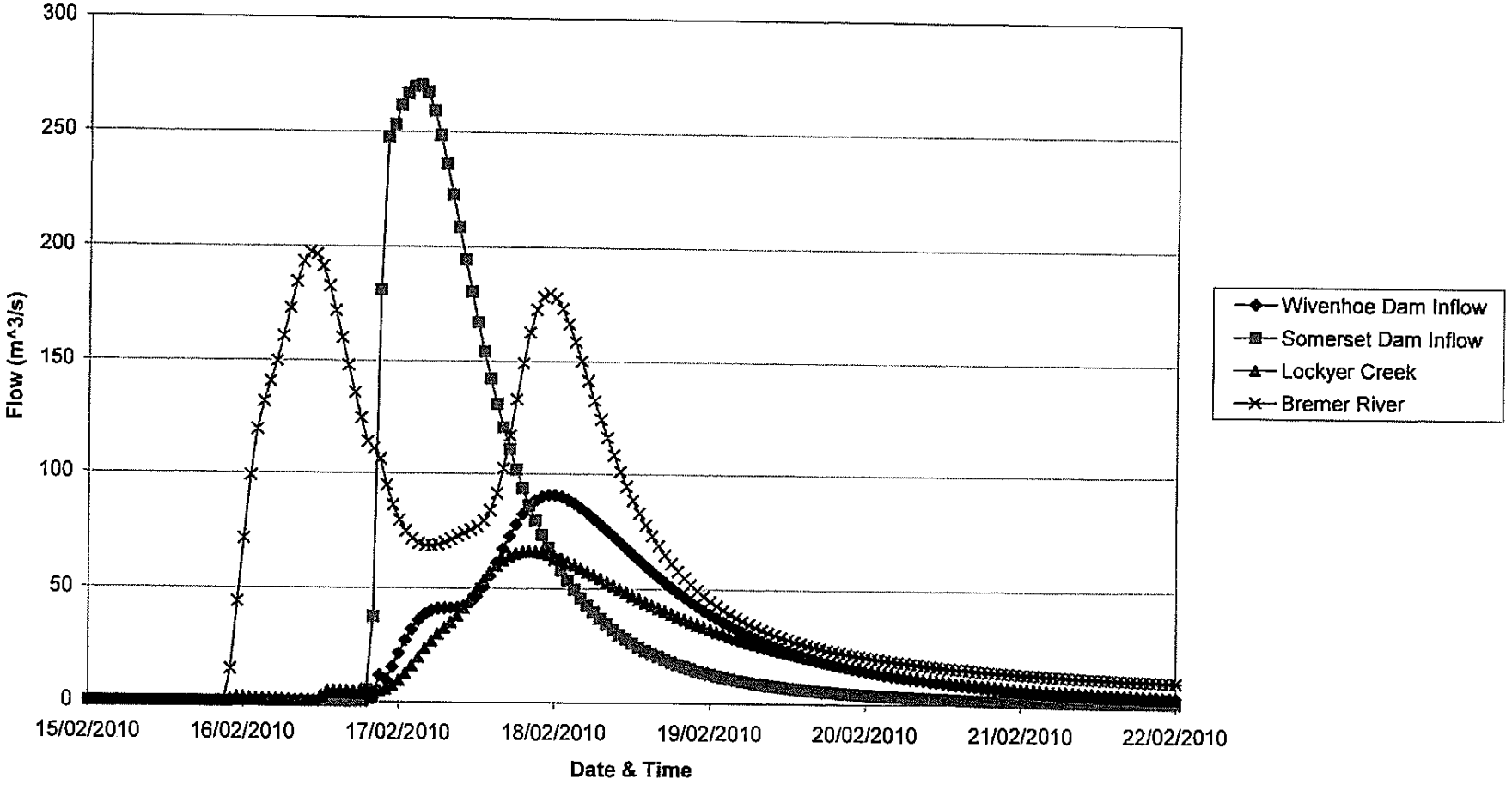
Start Of Event 10 March 2010	To / From	1.00 / 0.00	2.00 / 1.00	3.00 / 2.00	4.00 / 3.00	5.00 / 4.00	6.00 / 5.00	7.00 / 6.00	8.00 / 7.00	9.00 / 8.00	10.00 / 9.00	11.00 / 10.00	12.00 / 11.00	13.00 / 12.00	14.00 / 13.00	15.00 / 14.00	16.00 / 15.00	17.00 / 16.00	18.00 / 17.00	19.00 / 18.00	20.00 / 19.00	21.00 / 20.00	22.00 / 21.00	23.00 / 22.00	24.00 / 23.00	1.00 / 0.00	2.00 / 1.00	3.00 / 2.00	4.00 / 3.00	5.00 / 4.00	6.00 / 5.00	7.00 / 6.00	8.00 / 7.00	9.00 / 8.00	10.00 / 9.00	11.00 / 10.00	12.00 / 11.00	13.00 / 12.00	14.00 / 13.00	15.00 / 14.00	16.00 / 15.00	17.00 / 16.00	18.00 / 17.00	19.00 / 18.00	20.00 / 19.00	21.00 / 20.00	22.00 / 21.00	23.00 / 22.00	24.00 / 23.00
Shift Change 9.00																																																	
Shift Length 12 hours	Total Hours	Sunday, 14 March 2010																								Monday, 15 March 2010																							
Duty Engineers																																																
Rob Ayre	12																																																
Terry Malone																																																	
John Ruffini																																																	
John Tibaldi	6																																																
Data Collectors																																																	
[redacted]	9																																																

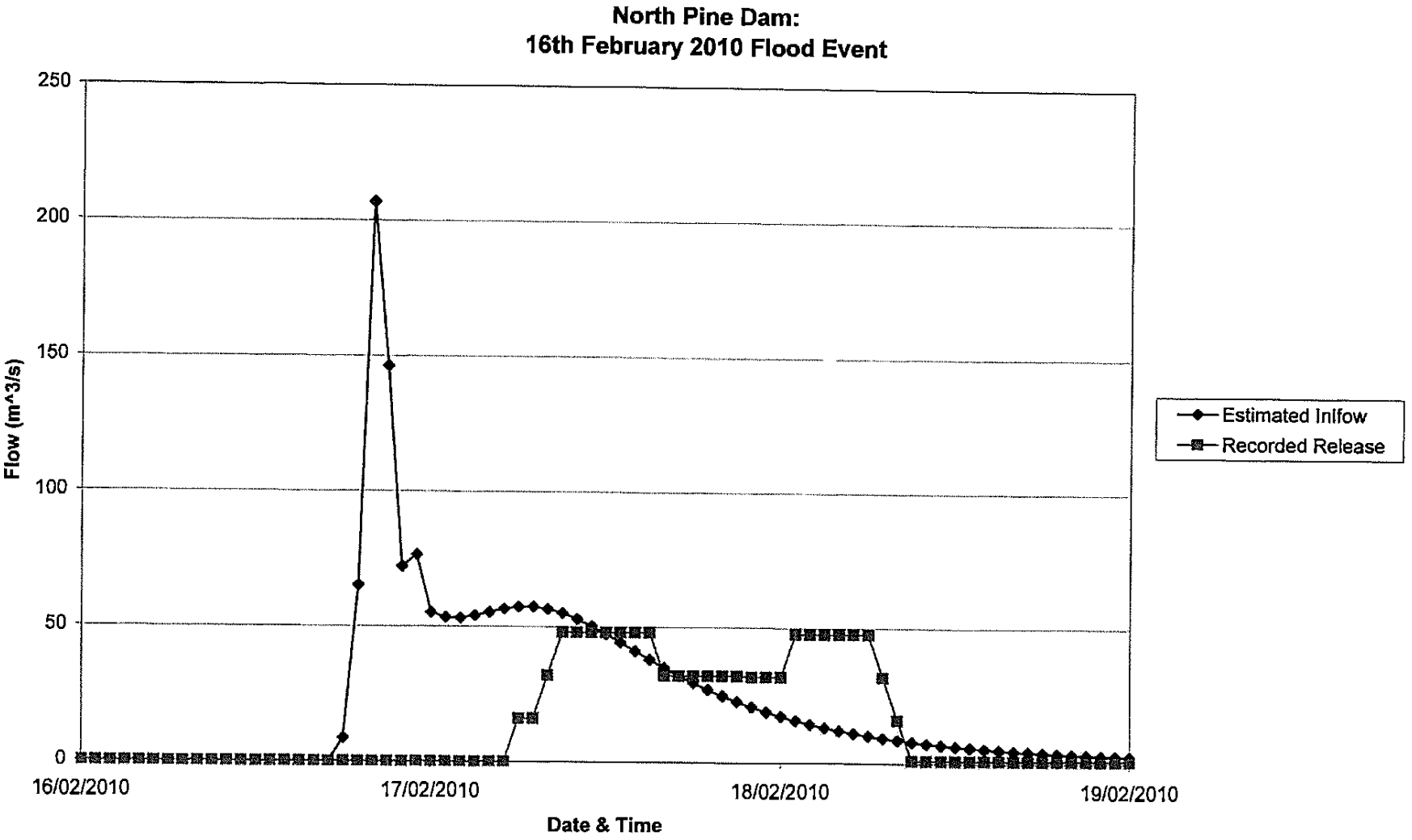
APPENDIX B

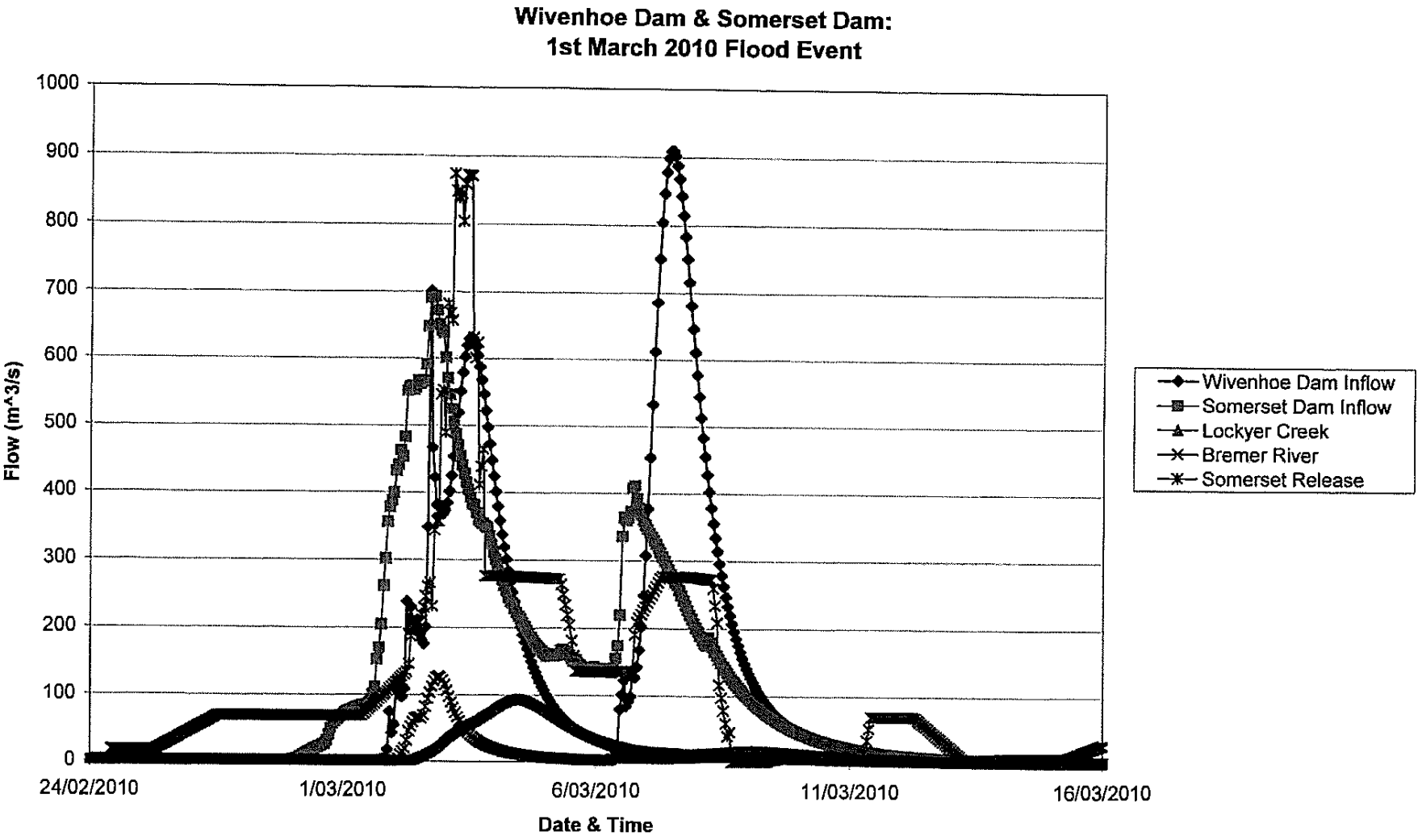
PLOTS OF ESTIMATED INFLOWS AND RECORDED RELEASES

- Figure B1 - Somerset Dam & Wivenhoe Dam February 2010
- Figure B2 - North Pine Dam February 2010
- Figure B3 - Somerset Dam & Wivenhoe Dam March 2010
- Figure B4 - North Pine Dam 1st March 2010
- Figure B5 - North Pine Dam 5th March 2010
- Figure B6 - North Pine Dam 10th March 2010

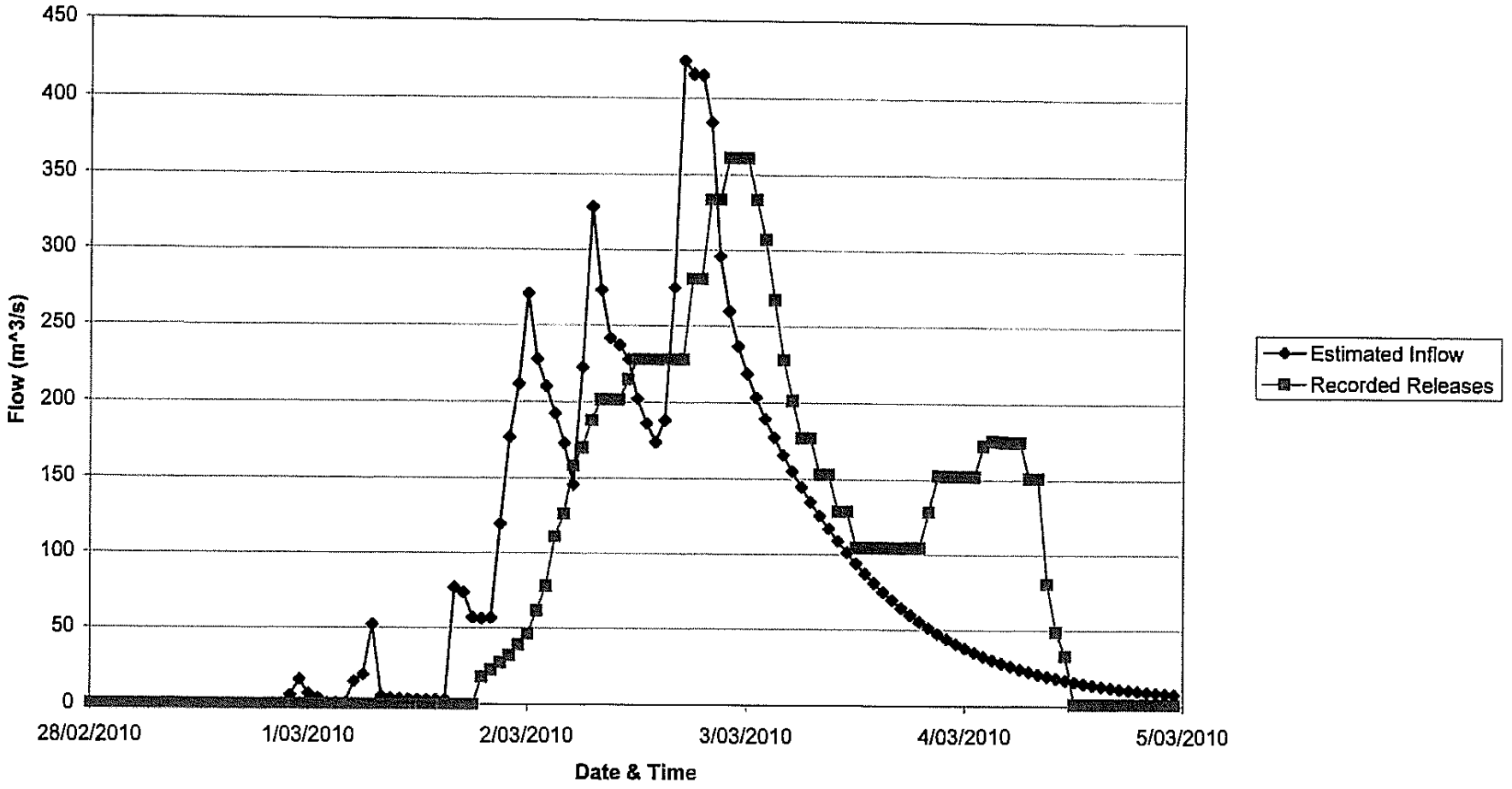
Wivenhoe Dam & Somerset Dam:
16th February 2010 Flood Event



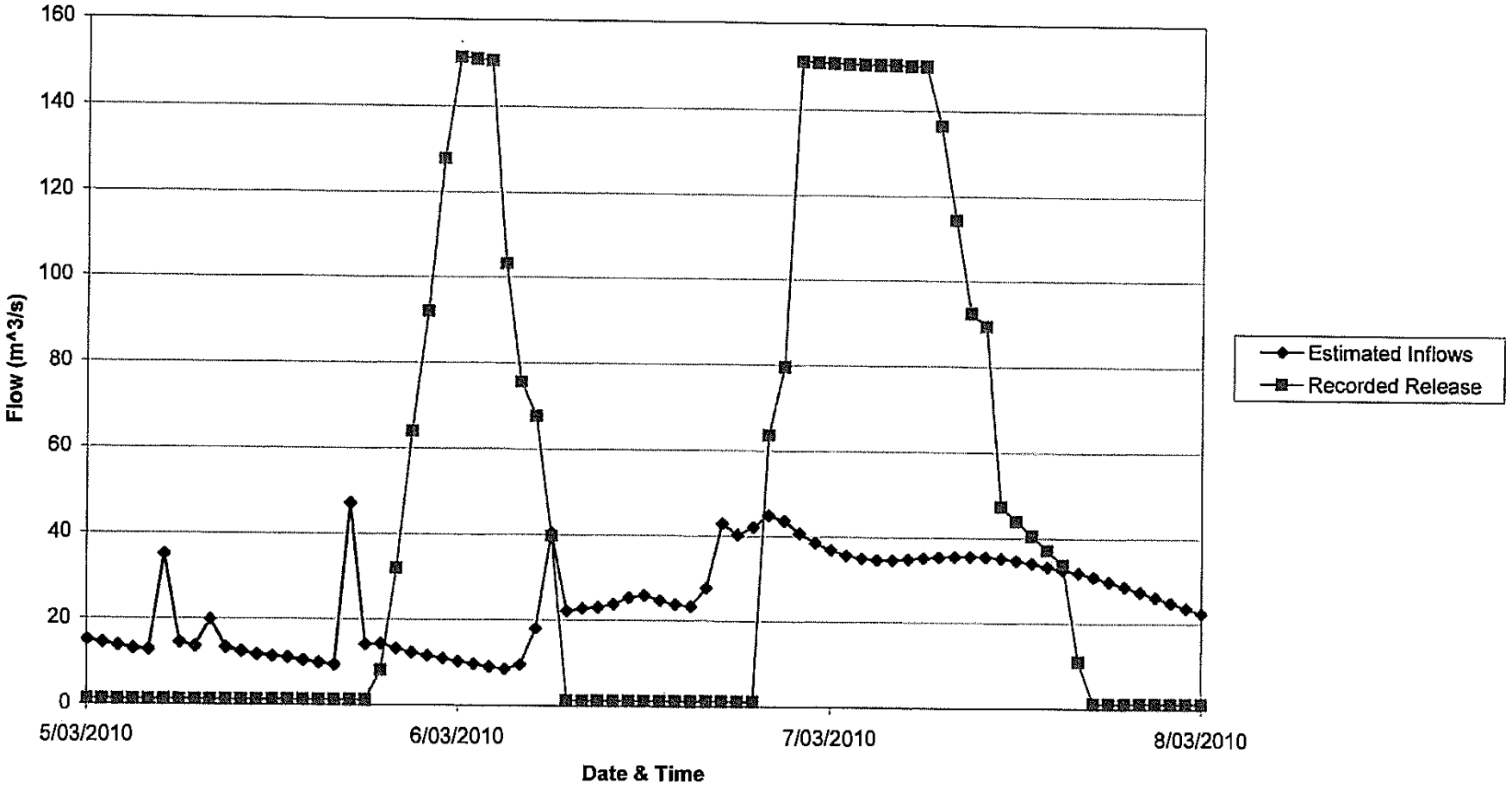

North Pine Dam:
16th February 2010 Flood Event
250
200
150
100
50
0
Flow (m^3/s)
16/02/2010
17/02/2010
18/02/2010
19/02/2010
Date & Time
Estimated Inlfow
Recorded Release


Wivenhoe Dam & Somerset Dam:
1st March 2010 Flood Event
Flow (m^3/s)
1000
900
800
700
600
500
400
300
200
100
0
24/02/2010
1/03/2010
6/03/2010
11/03/2010
16/03/2010
Date & Time
Wivenhoe Dam Inflow
Somerset Dam Inflow
Lockyer Creek
Bremer River
Somerset Release

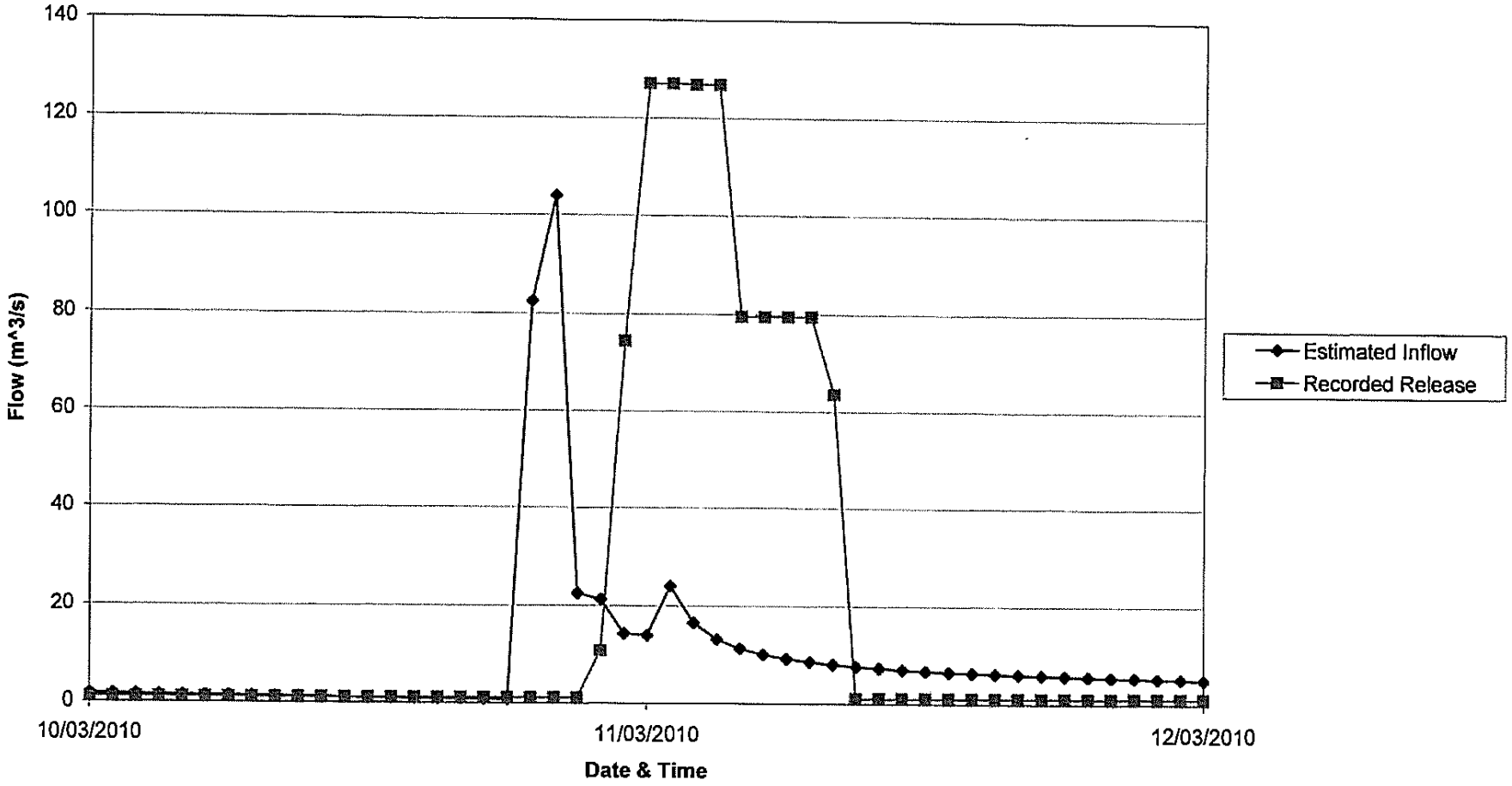
North Pine Dam:
1st March 2010 Flood Event



North Pine Dam:
5th March Flood Event



North Pine Dam:
10th March 2010 Flood Event

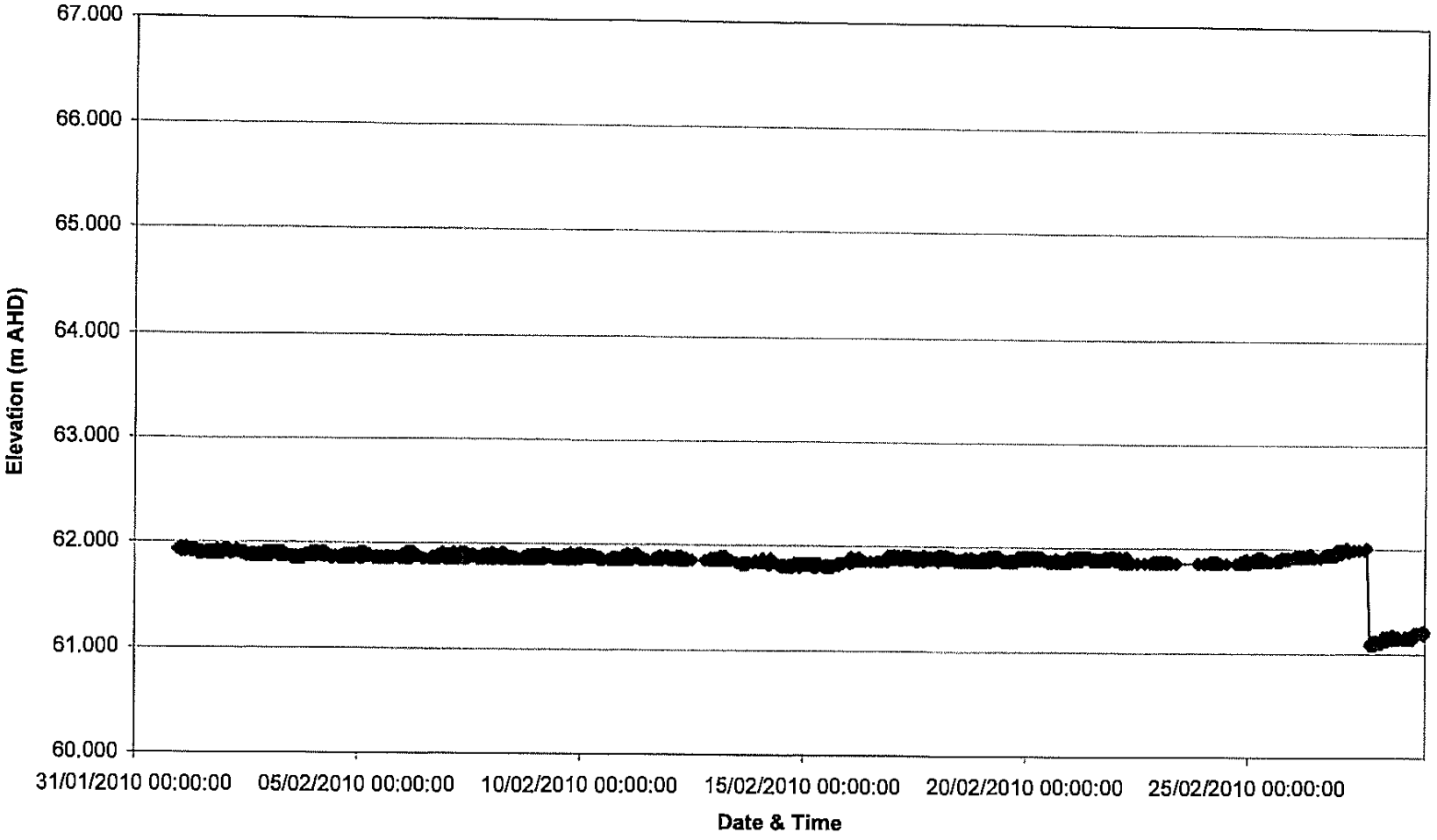


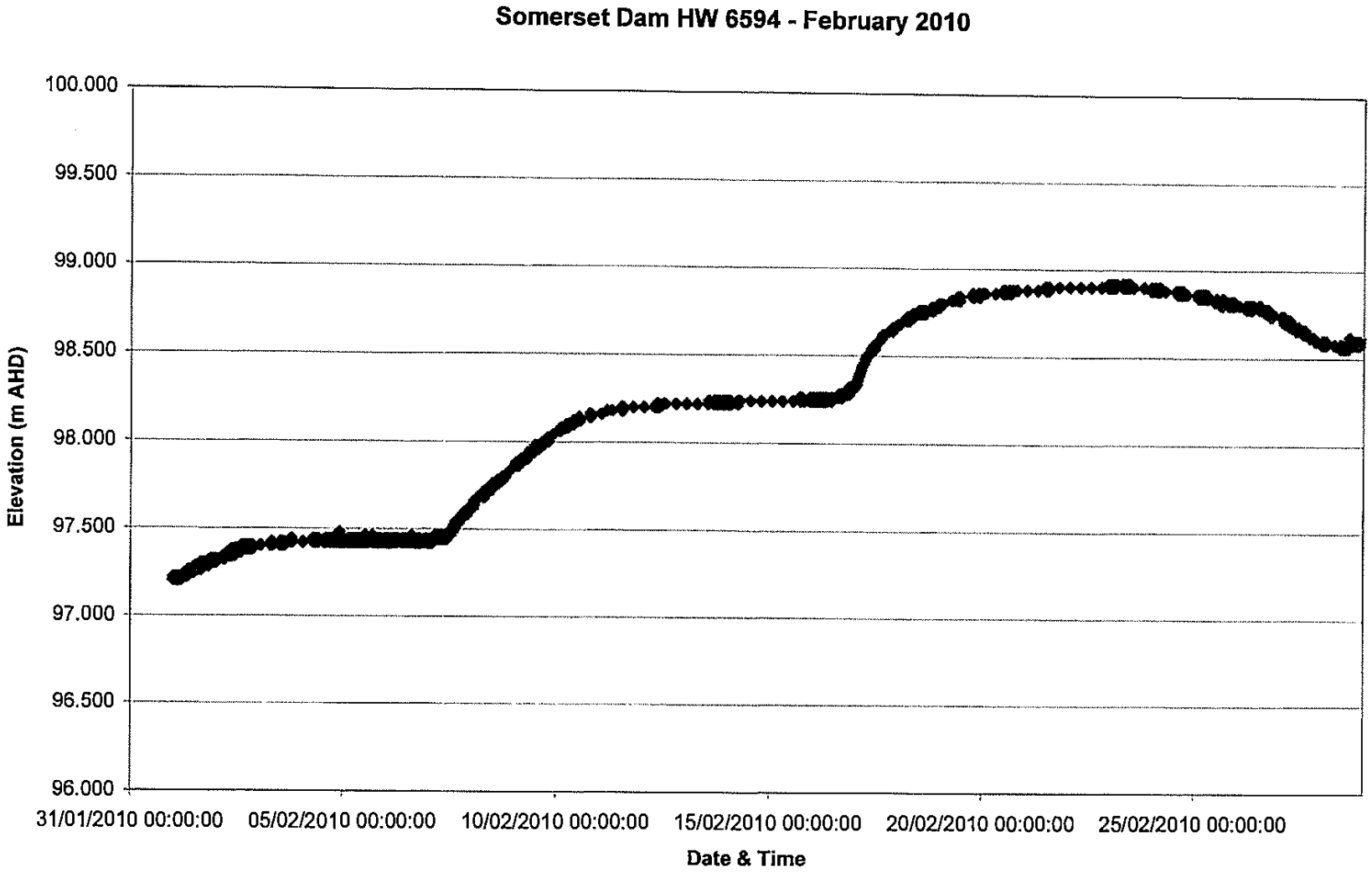
APPENDIX C

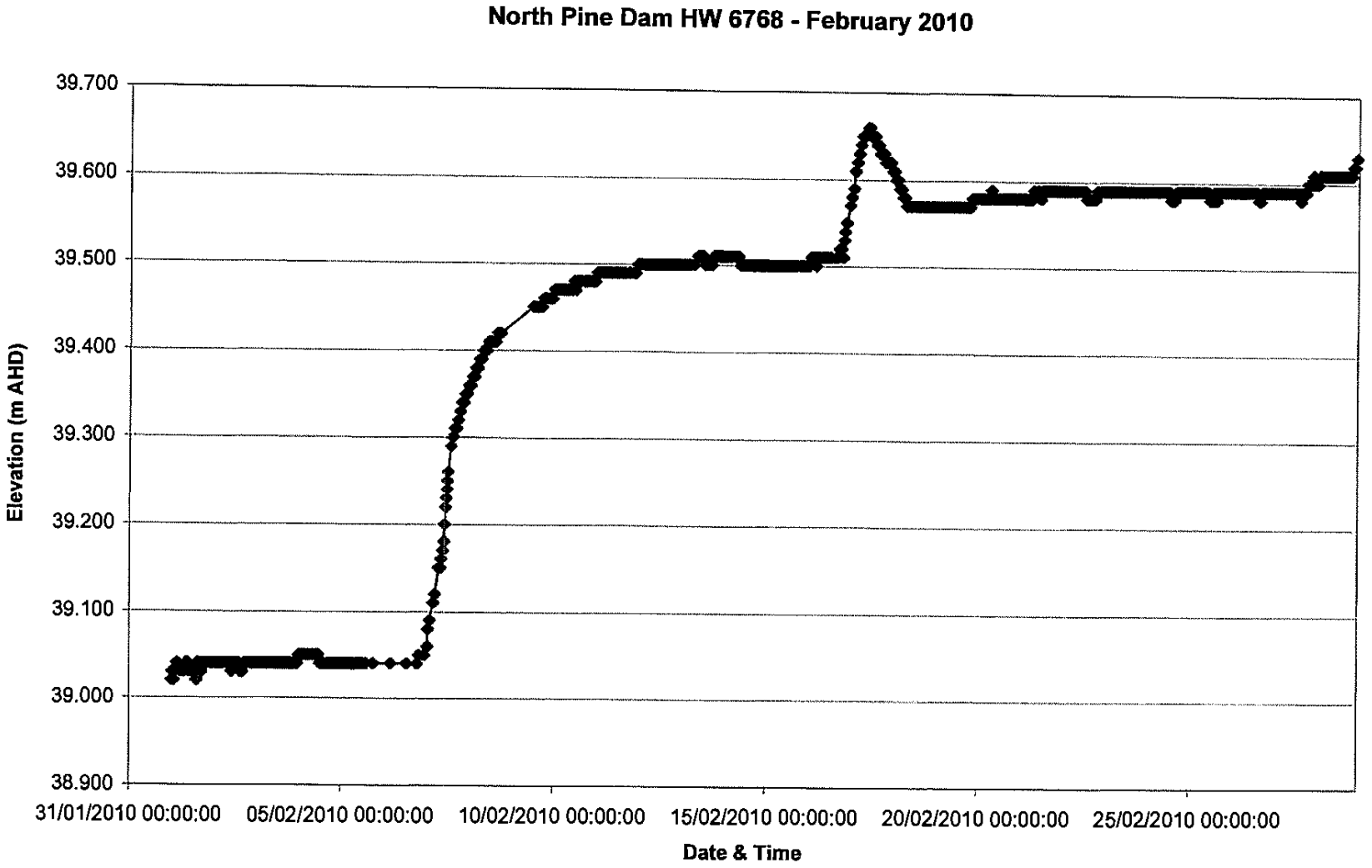
PLOTS OF HEADWATER LEVELS

- Figure C1 - Wivenhoe Dam February 2010
- Figure C2 - Somerset Dam February 2010
- Figure C3 - North Pine Dam February 2010
- Figure C4 - Wivenhoe Dam March 2010
- Figure C5 - Somerset Dam March 2010
- Figure C6 - North Pine Dam 1st March 2010
- Figure C7 - North Pine Dam 5th March 2010
- Figure C8 - North Pine Dam 10th March 2010

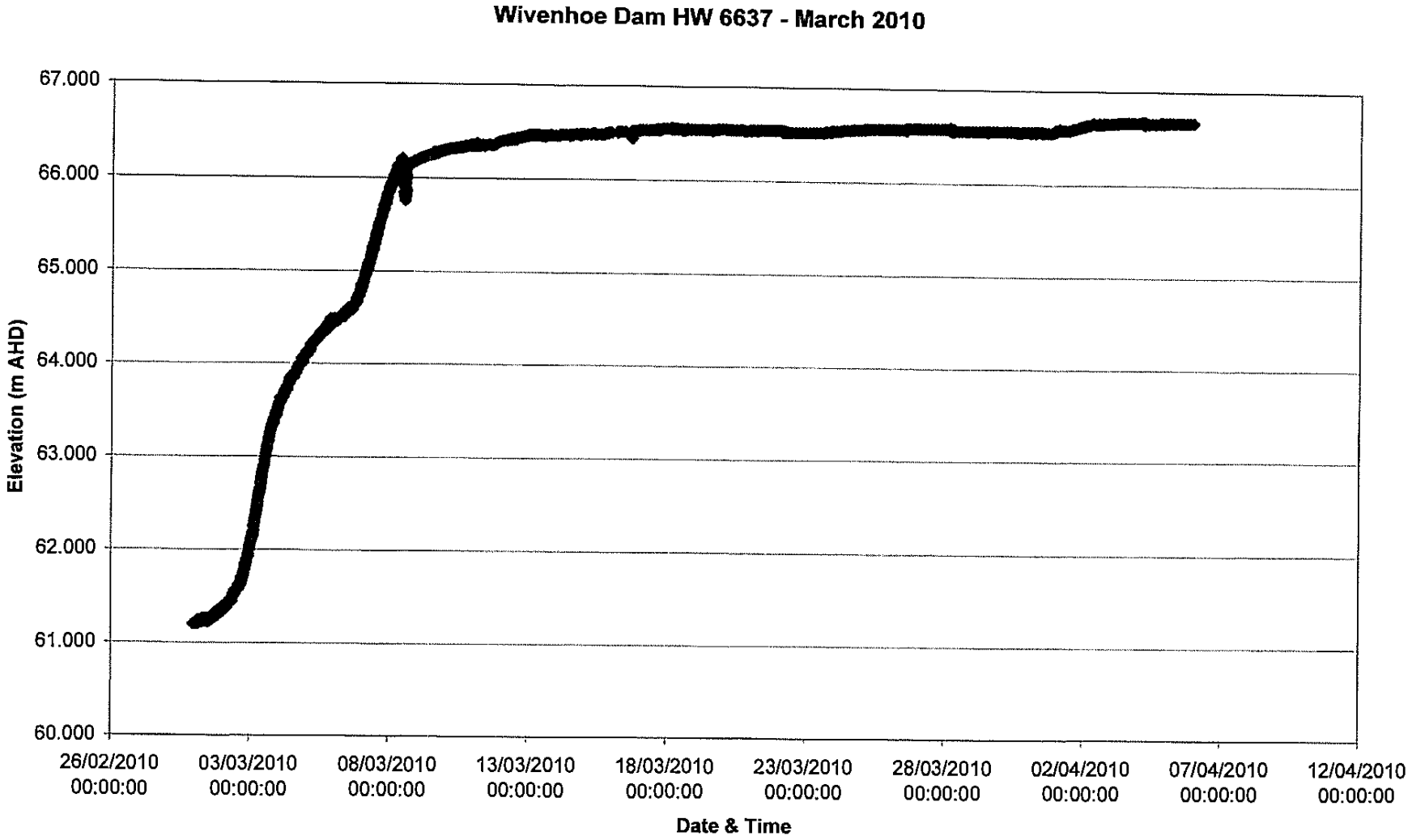
Wivenhoe Dam HW 6637 - February 2010

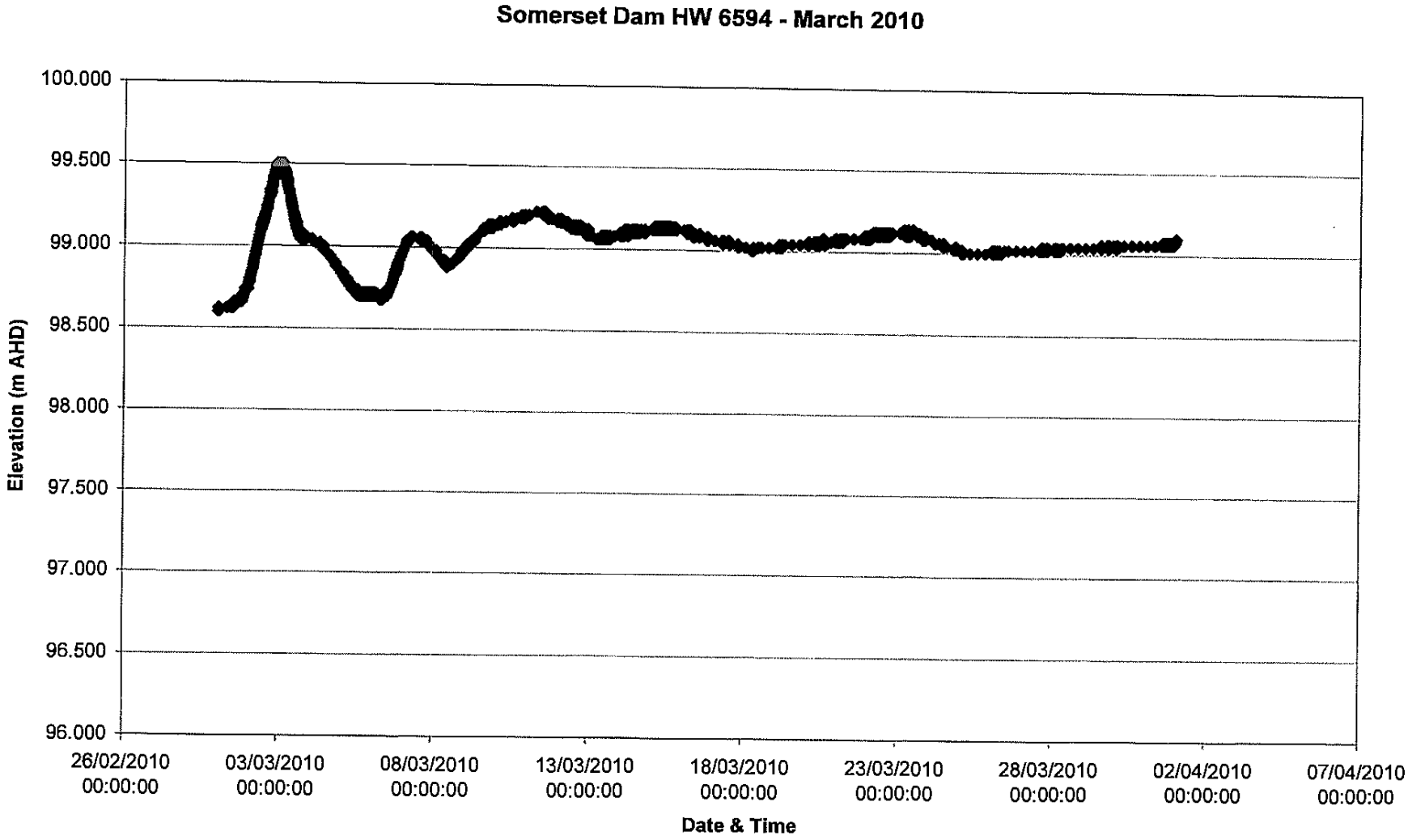



Somerset Dam HW 6594 - February 2010
100.000
99.500
99.000
98.500
98.000
97.500
97.000
96.500
96.000
Elevation (m AHD)
31/01/2010 00:00:00
05/02/2010 00:00:00
10/02/2010 00:00:00
15/02/2010 00:00:00
20/02/2010 00:00:00
25/02/2010 00:00:00
Date & Time

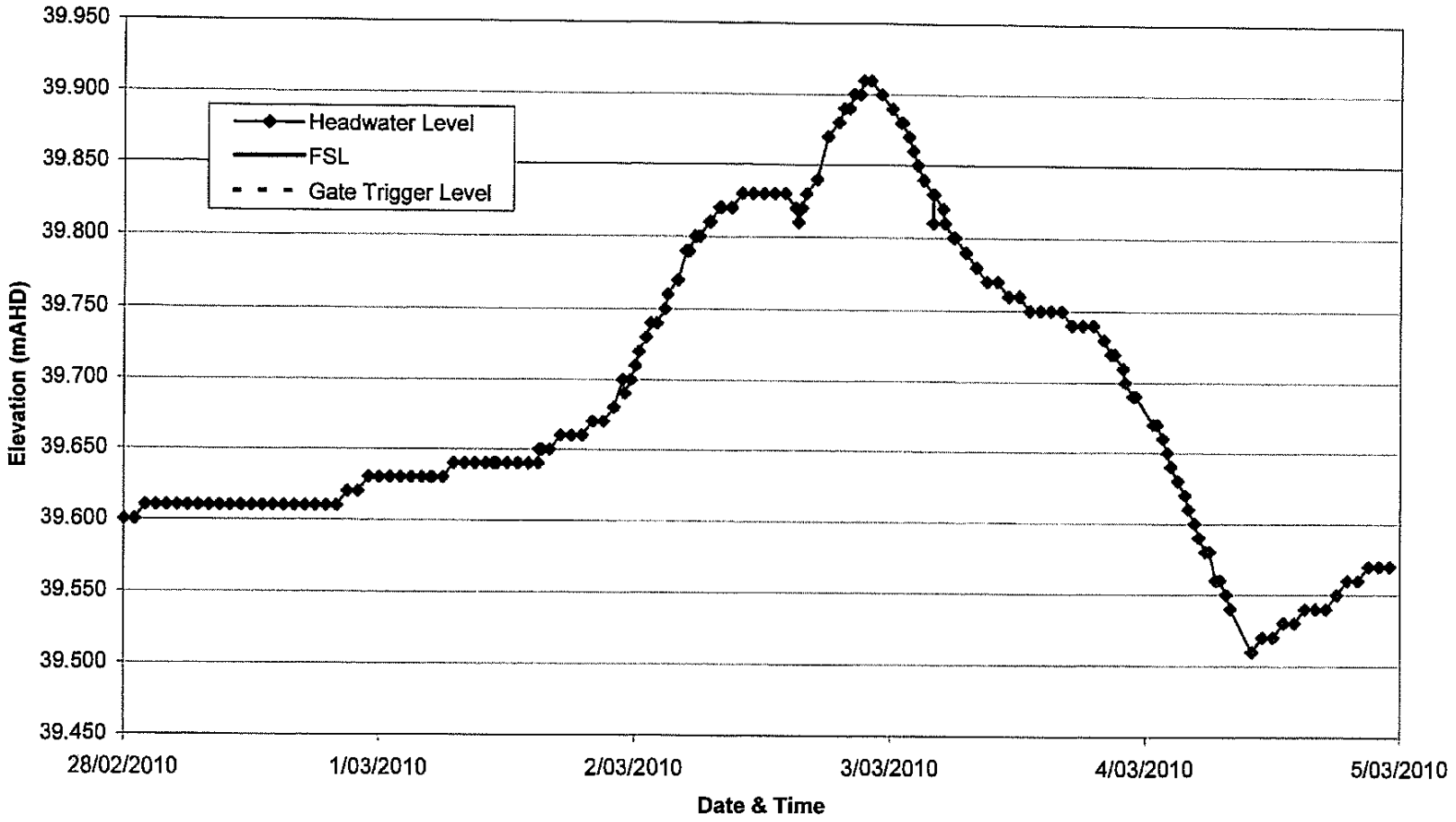

North Pine Dam HW 6768 - February 2010
39.700
39.600
39.500
39.400
39.300
39.200
39.100
39.000
38.900
Elevation (m AHD)
31/01/2010 00:00:00
05/02/2010 00:00:00
10/02/2010 00:00:00
15/02/2010 00:00:00
20/02/2010 00:00:00
25/02/2010 00:00:00
Date & Time

D853


Wivenhoe Dam HW 6637 - March 2010
67.000
66.000
65.000
64.000
63.000
62.000
61.000
60.000
Elevation (m AHD)
26/02/2010 00:00:00
03/03/2010 00:00:00
08/03/2010 00:00:00
13/03/2010 00:00:00
18/03/2010 00:00:00
23/03/2010 00:00:00
28/03/2010 00:00:00
02/04/2010 00:00:00
07/04/2010 00:00:00
12/04/2010 00:00:00
Date & Time

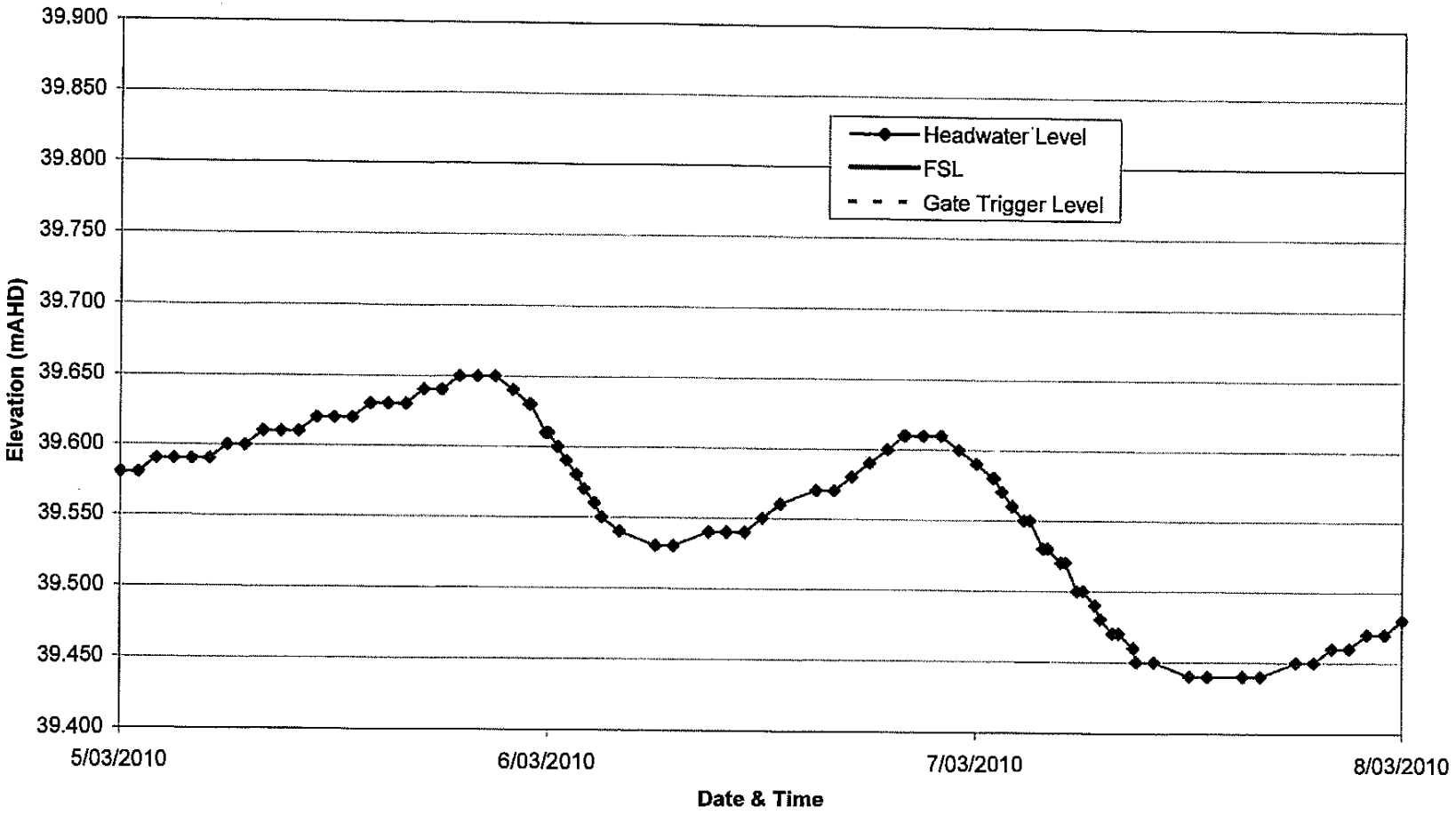

Somerset Dam HW 6594 - March 2010
100.000
99.500
99.000
98.500
98.000
97.500
97.000
96.500
96.000
Elevation (m AHD)
26/02/2010 00:00:00
03/03/2010 00:00:00
08/03/2010 00:00:00
13/03/2010 00:00:00
18/03/2010 00:00:00
23/03/2010 00:00:00
28/03/2010 00:00:00
02/04/2010 00:00:00
07/04/2010 00:00:00
Date & Time

North Pine Dam HW:
1st March 2010 Flood Event



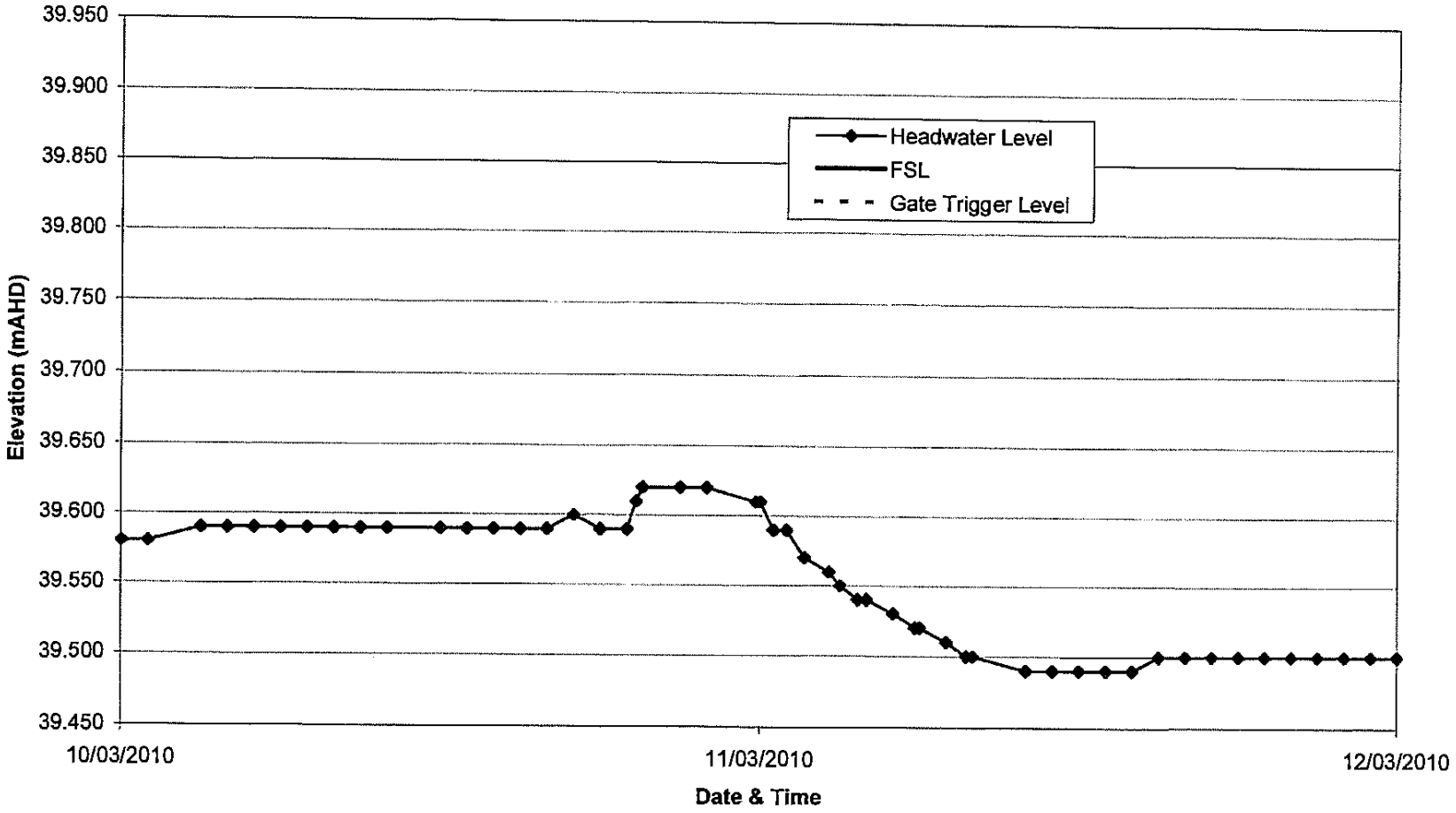
D856

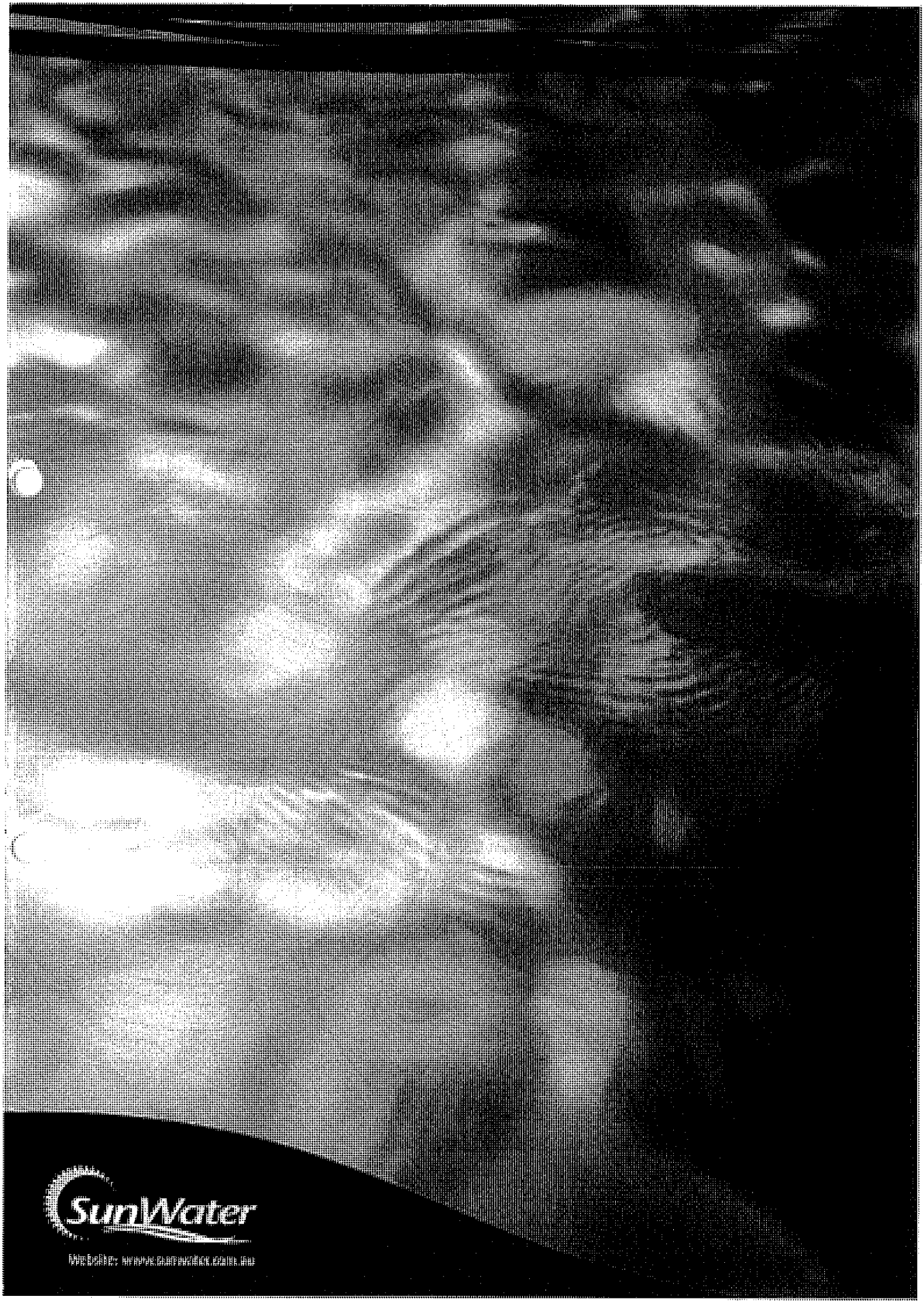
North Pine Dam HW:
5th March 2010 Flood Event

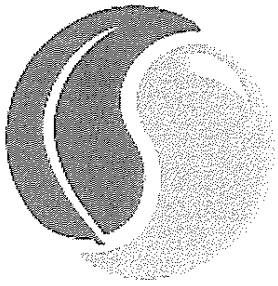


D857

North Pine Dam HW:
10th March 2010 Flood Event




SunWater



seqwater
WATER FOR LIFE

MANUAL

OF

OPERATIONAL PROCEDURES

FOR

FLOOD MITIGATION

AT

WIVENHOE DAM

AND

SOMERSET DAM

Uncontrolled Copy

Revision 7
November 2009

Revision No.	Date	Amendment Details
0	27 October 1968	Original Issue
1	6 October 1992	Complete revision and re-issue
2	13 November 1997	Complete revision and re-issue
3	24 August 1998	Change to page 23
4	6 September 2002	Complete revision and re-issue
5	4 October 2004	Complete revision
6	20 December 2004	Miscellaneous amendments and re-issue
7	November 2009	Complete Revision

TABLE OF CONTENTS

1 INTRODUCTION 1

1.1 Preface 1
1.2 Meaning of Terms 1
1.3 Purpose of Manual 3
1.4 Legal Authority 3
1.5 Application and Effect 3
1.6 Date of Effect 3
1.7 Observance of Manual 4
1.8 Provision for Variations to Manual 4
1.9 Distribution of Manual 4

2 DIRECTION OF OPERATIONS 5

2.1 Statutory Operation 5
2.2 Operational Arrangements 5
2.3 Designation and Responsibilities of Senior Flood Operations Engineer 5
2.4 Designation and Responsibilities of Flood Operations Engineer 6
2.5 Qualifications and Experience of Engineers 6
2.6 Schedule of Authorities 7
2.7 Training 7
2.8 Reasonable Discretion 7
2.9 Report 8

3 FLOOD MITIGATION OBJECTIVES 9

3.1 General 9
3.2 Structural Safety of Dams 9
3.3 Inundation of Urban Areas 10
3.4 Disruption to Rural Areas 10
3.5 Retain the storage at Full Supply Level at the Conclusion of the Flood Event 11
3.6 Minimising Impacts to Riparian Flora and Fauna 11

4 FLOOD CLASSIFICATION 12

D862

5 FLOOD MONITORING AND FORECASTING SYSTEM 13

5.1 General 13
5.2 Operation 13
5.3 Storage of Documentation 14
5.4 Key Reference Gauges 14
5.5 Reference Gauge Values 14

6 COMMUNICATIONS 15

6.1 Communications between Staff 15
6.2 Dissemination of Information 15
6.3 Release of Information to the Public 16

7 REVIEW 17

7.1 Introduction 17
7.2 Personnel Training 17
7.3 Monitoring and Forecasting System and Communication Networks 17
7.4 Operational Review 17
7.5 Five Yearly Review 18

8 WIVENHOE DAM FLOOD OPERATIONS 19

8.1 Introduction 19
8.2 Flood Release Infrastructure 19
8.3 Initial Flood Control Action 21
8.4 Flood Operations Strategies 22
8.5 Gate Closing Strategies 31
8.6 Gate Operation Sequences 31
8.7 Modification to Flood Operating Procedures if a Fuse Plug Triggers 36
8.8 Modification to Flood Operating Procedures if a subsequent flood event occurs prior to the reconstruction of Triggered Fuse Plugs 36

9 SOMERSET DAM FLOOD OPERATIONS 37

9.1 Introduction 37
9.2 Initial Flood Control Action 37
9.3 Flood Operations Strategies 37
9.4 Gate Closing Strategies 41
9.5 Gate Operation Sequences 42

D863

10 EMERGENCY FLOOD OPERATIONS 43

10.1 Introduction 43

10.2 Overtopping of Dams 43

10.3 Communications Failure 43

10.4 Equipment Failure 49

APPENDIX A – AGENCIES HOLDING CONTROLLED COPIES OF THIS MANUAL

APPENDIX B – KEY REFERENCE GAUGES

APPENDIX C – WIVENHOE DAM TECHNICAL DATA

APPENDIX D – SOMERSET DAM TECHNICAL DATA

APPENDIX E – WIVENHOE DAM GATE OPERATION CONSIDERATIONS

APPENDIX F – SOMERSET DAM AUXILIARY EQUIPMENT

APPENDIX G – HYDROLOGIC INVESTIGATIONS

APPENDIX H – WIVENHOE DAM (PLANS, MAPS AND PHOTOGRAPHS)

APPENDIX I – SOMERSET DAM (PLANS, MAPS AND PHOTOGRAPHS)

APPENDIX J – WIVENHOE DAM – FUSE PLUG BREACH SCENARIOS

APPENDIX K – BRIDGES IMPACTED BY FLOOD RELEASES AND ELEVATED STORAGE LEVELS

1 INTRODUCTION

1.1 Preface

Given their potential significant impact on downstream populations, it is imperative that Wivenhoe and Somerset Dams be operated during flood events in accordance with clearly defined procedures to minimise impacts to life and property. This manual outlines these procedures and is an approved Flood Mitigation Manual under Water Supply Act 2008.

The Manual in its current form was developed in 1992 and the basis of this document was a manual written in 1968 covering flood operations at Somerset Dam (Wivenhoe Dam was completed in 1984). Six revisions of the Manual have occurred since 1992 to account for updates to the Flood Alert Network and the Real Time Flood Models, the construction of an Auxiliary Spillway at Wivenhoe Dam in 2005 and to account for institutional and legislative changes.

The primary objectives of the procedures contained in this Manual are essentially the same as those contained in previous Manual versions. These objectives in order of importance are:

- Ensure the structural safety of the dams;
- Provide optimum protection of urbanised areas from inundation;
- Minimise disruption to rural life in the valleys of the Brisbane and Stanley Rivers;
- Retain the storage at Full Supply Level at the conclusion of the Flood Event.
- Minimise impacts to riparian flora and fauna during the drain down phase of the Flood Event.

In meeting these objectives, the dams must be operated to account for the potential effects of closely spaced Flood Events. Accordingly, normal procedures require stored floodwaters to be emptied from the dams within seven days of the flood event peak passing through the dams.

Wivenhoe Dam and Somerset Dam are operated in conjunction so as to maximise the overall flood mitigation capabilities of the two dams. The procedures outlined in this Manual are based on the operation of the dams in tandem.

1.2 Meaning of Terms

In this Manual, save where a contrary definition appears -

"Act" means the *Water Supply (Safety and Reliability) Act 2008*;

"AEP" means annual exceedance probability, the probability of a specified event being exceeded in any year.

"Agency" includes a person, a local government and a department of state government within the meaning of the Acts Interpretation Act 1954;

D865

"AHD" means Australian Height Datum;

"Chairperson" means the Chairperson of Seqwater;

"Chief Executive" means the Director General of the Department of Environment and Resource Management or nominated delegate;

"Controlled Document" means a document subject to managerial control over its contents, distribution and storage. It may have legal and contractual implications;

"Dams" means dams to which this Manual applies, that is Wivenhoe Dam and Somerset Dam;

"Dam Supervisor" means the senior on-site officer at Wivenhoe or Somerset Dam as the case may be;

"Duty Flood Operations Engineer" means the Senior Flood Operations Engineer or Flood Operations Engineer rostered on duty to be in charge of Flood Operations at the dams;

"EL" means elevation in metres Australian Height Datum;

"Flood Event" is a situation where the Duty Flood Operations Engineer expects the water level in either of the Dams to exceed the Full Supply Level;

"Flood Operations Centre" means the Centre used during by Flood Operations Engineers to manage Flood Events;

"Flood Operations Engineer" means a person designated to direct flood operations at the dams in accordance with Section 2.4 of this Manual;

"FSL" or "Full Supply Level" means the level of the water surface when the reservoir is at maximum operating level, excluding periods of flood discharge;

"Gauge" when referred to in (m) means river level referenced to AHD, and when referred to in (m^3/s) means flow rate in cubic metres per second;

"Manual" or "Manual of Operational Procedures for Flood Events at Wivenhoe Dam and Somerset Dam" means the current version of this Manual;

"Power Station" means the Wivenhoe pumped storage hydro-electric power station associated with Wivenhoe Dam and Split-Yard Creek Dam;

"Senior Flood Operations Engineer" means a person designated in accordance with Section 2.3 of this Manual under whose general direction the procedures in this Manual must be carried out;

"Seqwater" means the Queensland Bulk Water Supply Authority trading as Seqwater.

D866

1.3 Purpose of Manual

The purpose of this Manual is to define procedures for the operation of Wivenhoe Dam and Somerset Dam to reduce, so far as practicable, the effects of flooding associated with the dams. This is achieved by the proper control and regulation in time of the flood release infrastructure at the dams, with due regard to the safety of the dam structures.

The procedures in this Manual have been developed on the basis that the community is to be protected to the maximum extent practical against flood hazards recognising the limitations on being able to:

- Obtain accurate forecasts of rainfall during flood events;
- Accurately estimate flood run-off within the dam catchments;
- Identify all potential flood hazards and their likelihood;
- Remove or reduce community vulnerability to flood hazards;
- Effectively respond to flooding;
- Provide resources in a cost effective manner.

1.4 Legal Authority

This manual has been prepared as a Flood Mitigation Manual in accordance with Chapter 4 Part 2 of the Act.

1.5 Application and Effect

The procedures in this Manual apply to the operation of Wivenhoe Dam and Somerset Dam for the purpose of flood mitigation, and operation in accordance with the manual shall give the protection from liability provided by Section 374 of the Act.

1.6 Date of Effect

The procedures in this Manual shall have effect on and from the date on which this version of the Manual is approved by gazette notice.

The Manual shall remain in force for the period of approval as determined by the Chief Executive. This approval may be for a period of up to five years.

Before the approval of the Manual expires, Seqwater must review and if necessary update the Manual and submit a copy to the chief executive for approval.

D867

1.7 Observance of Manual

This Manual contains the operational procedures for Wivenhoe Dam and Somerset Dam for the purposes of flood mitigation and must be used for the operation of the dams during flood events.

1.8 Provision for Variations to Manual

If Seqwater is of the opinion that this Manual should be amended, altered or varied, it must submit for approval as soon as practical, an appropriate request to the Chief Executive, setting out the circumstances and the exact nature of the amendment, alteration or variation sought. The Chief Executive may accept, reject or modify the request prior to approval.

1.9 Distribution of Manual

Seqwater must regard the manual as a Controlled Document and ensure that only controlled manuals are used in the direction of flood mitigation activities. Agencies having copies of controlled hardcopies of the Manual are listed in Appendix A. Seqwater must maintain a Register of Contact Persons for issued controlled hardcopies of the Manual and must ensure that each issued document is updated whenever amendments or changes are approved.

D868

2 DIRECTION OF OPERATIONS

2.1 Statutory Operation

Pursuant to the provisions of the Act, Seqwater is responsible for operating and maintaining the dams in accordance with this Manual in order to retain the protection from liability afforded by the Act. Operators, employees, agents, and contractors working for Seqwater must also comply with this Manual to obtain the protection of the Act.

2.2 Operational Arrangements

For the purposes of operation of the dams during Flood Events, Seqwater must ensure that:

- Sufficient numbers of suitably qualified personnel are available to operate the dams if a Flood Event occurs.
- Sufficient numbers of suitably qualified personnel are available to operate the Flood Operations Centre if a Flood Event occurs
- A Duty Flood Operations Engineer is on call at all times. The Duty Flood Operations Engineer must constantly review weather forecasts and catchment rainfall and must declare a Flood Event if the water level of either Wivenhoe or Somerset Dam is expected to exceed Full Supply Level as a result of prevailing or predicted weather conditions.
- A Senior Flood Operations Engineer is designated to be in the charge of Flood Operations at all times during a Flood Event.
- Release of water at the dams during Flood Events is carried out under the direction of the Duty Flood Operations Engineer.
- All practical attempts are made to liaise with the Chairperson and the Chief Executive if the release of water from the Dams during a Flood Event is likely to endanger life or property.

2.3 Designation and Responsibilities of Senior Flood Operations Engineer

Seqwater must nominate one or more suitably qualified and experienced persons to undertake the role of Senior Flood Operations Engineer. If approved by the Chief Executive, these persons can be authorised in the Schedule of Authorities (see Section 2.6). When rostered on duty during a Flood Event, the responsibilities of the Senior Flood Engineer are as follows:

- Set the overall strategy for management of the Flood Event in accordance with the objectives of this Manual.
- Provide instructions to site staff to make releases of water from the Dams during Flood Events that are in accordance with this Manual.
- Apply reasonable discretion in managing a Flood Event as described in Section 2.8.

D869

Seqwater must ensure that an adequate number of Senior Flood Operations Engineers are available to manage all Flood Events.

2.4 Designation and Responsibilities of Flood Operations Engineer

Seqwater must nominate one or more suitably qualified and experienced persons to undertake the role of Flood Operations Engineer. If approved by the Chief Executive, these persons can be authorised in the Schedule of Authorities (see Section 2.6). When rostered on duty during a Flood Event, the responsibilities of the Flood Engineer are as follows:

- Direct the operation of the dams during a flood event in accordance with the general strategy determined by the Senior Flood Operations Engineer.
- Follow any direction from the Senior Flood Operations Engineer in relation to applying reasonable discretion in managing a Flood Event as described in Section 2.8. Unless otherwise directed, a Flood Operations Engineer is to follow this Manual in managing Flood Events and is not to apply reasonable discretion unless directed by the Senior Flood Operations Engineer or the Chief Executive.
- Provide instructions to site staff to make releases of water from the Dams during Flood Events that are in accordance with this Manual.

Seqwater must ensure that an adequate number of Flood Operations Engineers are available to manage all Flood Events. Seqwater must also ensure that an adequate number of suitably qualified and experienced persons are available to assist the Flood Operations Engineers during all Floods Events.

2.5 Qualifications and Experience of Engineers

Qualifications

All engineers referred to in Sections 2.3 and 2.4 must hold a Certificate of Registration as a Registered Professional Engineer of Queensland and must hold appropriate engineering qualifications to the satisfaction of the Chief Executive.

Experience

All engineers referred to in Sections 2.3 and 2.4 must, to the satisfaction of the Chief Executive, have:

(1) Knowledge of design principles related to the structural, geotechnical and hydraulic design of large dams, and

(2) At least a total of five years of suitable experience and demonstrated expertise in at least two of the following areas:

D870

- Investigation, design or construction of major dams;
- Operation and maintenance of major dams;
- Hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology;
- Applied hydrology with particular reference to flood forecasting and/or flood forecasting systems.

2.6 Schedule of Authorities

Seqwater must maintain a Schedule of Authorities containing a list of the Senior Flood Operations Engineers and Flood Operations Engineers approved by the Chief Executive to direct flood operations at the dams during floods. A copy of the Schedule of Authority must be provided to the Chief Executive by 30 September of each year.

Seqwater shall nominate suitably qualified and experienced engineers for registration in the Schedule of Authorities as the need arises. Each new nomination must include a validated statement of qualifications and experience as required by the Chief Executive. Seqwater must obtain the approval for all nominations from the Chief Executive prior to their inclusion in the Schedule of Authorities.

If, in the event of unforseen and emergency situations, no Senior Flood Operations Engineer or no Flood Operations Engineer is available from the Schedule of Authorities to manage a Flood Event, Seqwater must temporarily appoint a suitable person or persons and immediately seek ratification from the Chief Executive.

2.7 Training

Seqwater must ensure that operational personnel required for flood operations activities receive adequate training in the various activities involved in flood control operation as required by the Chief Executive.

2.8 Reasonable Discretion

If in the opinion of the Senior Flood Operations Engineer, it is necessary to depart from the procedures set out in this Manual to meet the flood mitigation objectives set out in Section 3, the Senior Flood Operations Engineer is authorised to adopt such other procedures as considered necessary subject to the following:

- Before exercising discretion under this Section of the Manual with respect to flood mitigation operations, the Senior Flood Operations Engineer must make a reasonable attempt to consult with both the Chairperson and Chief Executive.
- The Chief Executive would normally authorise any departures from the Manual. However if the Chief Executive cannot be contacted within a reasonable time, departures from the Manual can be authorised by the Chairperson.
- If both the Chairperson and the Chief Executive cannot be contacted within a reasonable time, the Senior Flood Operations Engineer may proceed with the procedures considered

D871

necessary and report such action at the earliest opportunity to the Chairperson and Chief Executive.

2.9 Report

Seqwater must prepare a report after each Flood Event. The report must contain details of the procedures used, the reasons therefore and other pertinent information. Seqwater must forward the report to the Chief Executive within six weeks of the completion of the Flood Event.

D872

3 FLOOD MITIGATION OBJECTIVES

3.1 General

To meet the purpose of the flood operational procedures in this Manual, the following objectives, listed in descending order of importance, are as follows:

- Ensure the structural safety of the dams;
- Provide optimum protection of urbanised areas from inundation;
- Minimise disruption to rural life in the valleys of the Brisbane and Stanley Rivers;
- Retain the storage at Full Supply Level at the conclusion of the Flood Event.
- Minimise impacts to riparian flora and fauna during the drain down phase of the Flood Event.

In meeting these objectives, the dams must be operated to account for the potential effects of closely spaced Flood Events. Accordingly, normal procedures require stored floodwaters to be emptied from the dams within seven days of the flood event peak passing through the dams.

Additionally, the auxiliary spillway constructed at Wivenhoe Dam in 2005 incorporates fuse plugs. Triggering of a fuse plug will increase floods levels downstream. Where possible, gate operations at both Wivenhoe and Somerset dams should be formulated to prevent operation of the fuse plug. This potential scenario is possible only when the forecast peak water level for Wivenhoe Dam just exceeds the trigger level for the fuse plug and sufficient time is available to alter releases.

3.2 Structural Safety of Dams

The structural safety of the dams must be the first consideration in the operation of the dams for the purpose of flood mitigation.

Wivenhoe Dam

The structural safety of Wivenhoe Dam is of paramount importance. Structural failure of Wivenhoe Dam would have catastrophic consequences. Wivenhoe Dam is predominantly a central core rockfill dam. Such dams are not resistant to overtopping and are susceptible to breaching should such an event occur. Overtopping is considered a major threat to the security of Wivenhoe Dam. Wivenhoe Dam is overtopped by an event with a 1 in 100,000 AEP.

Somerset Dam

The structural safety of Somerset Dam also is of paramount importance. Failure of Somerset Dam could have catastrophic consequences. Whilst Wivenhoe Dam has the capacity to mitigate the flood effects of such a failure in the absence of any other flooding, if the failure were to occur during major flooding, Wivenhoe Dam could be overtopped and destroyed also.

D873

Somerset Dam is a mass concrete dam. Such dams can withstand limited overtopping without damage. Failure of such structures is rare but when they do occur, they occur suddenly without warning, creating very severe and destructive flood waves. Although Somerset Dam is overtopped by an event with a 1 in 5,000 AEP, it is expected that the dam could withstand at least 2.2 metres of overtopping without failure, provided all radial gates are fully open. This equates to an event centred on the Somerset Dam catchment with a 1 in 20,000 AEP.

Extreme Floods and Closely Spaced Large Floods

As indicated in the previous section, techniques for estimating extreme floods show that floods are possible which would overtop both dams. In the case of Wivenhoe Dam such an overtopping would most likely result in the destruction of the dam. Such events however require several days of intense rainfall to produce the necessary runoff.

Historical records show that there is a significant probability of two or more flood producing storms occurring in the Brisbane River system within a short time of each other. Therefore, unless determined otherwise by the Senior Flood Operations Engineer in accordance with Section 2.8, the aim during a Flood Event should be to empty stored floodwaters within seven days after the flood peak has passed through the dams. In a very large flood, this time frame may not be achievable because of downstream flood conditions and it may be necessary to extend the emptying period by several days.

The discharges from the dams should be regulated so as to have little impact on the urban reaches of the Brisbane River, taking into account inflows into the river downstream of the dams. However the seven day drainage requirement may result in submergence of some bridges. Regardless, the level of flooding as a result of emptying stored floodwaters after the peak has passed is to be less than the flood peak unless accelerated release is necessary to reduce the risk of overtopping.

3.3 Inundation of Urban Areas

The prime purpose of incorporating flood mitigation measures into Wivenhoe Dam and Somerset Dam is to reduce flooding in the urban areas of the flood plains below Wivenhoe Dam. The peak flows of floods emanating from the upper catchments of Brisbane and Stanley Rivers can be reduced by controlling flood releases from the dams, while taking into account flooding derived from the lower Brisbane River catchments.

3.4 Disruption to Rural Areas

While the dams are being used for flood mitigation purposes, bridges and areas upstream of the dams may be temporarily inundated. Downstream of the dam, bridges and lower river terraces will be submerged. The operation of the dams should not prolong this inundation unnecessarily.

Disruption to navigation in the Brisbane River can also be taken into account when considering disruption to rural areas downstream of the dam. Generally, this consideration is secondary to considerations associated with reducing bridge inundation.

D874

3.5 Retain the storage at Full Supply Level at the Conclusion of the Flood Event

As the dams are the primary urban water supply for South East Queensland, it is important that all opportunities to fill the dams are taken. There should be no reason why the dams should not be full following a Flood Event.

3.6 Minimising Impacts to Riparian Flora and Fauna

During the drain down phase, consideration is to be given to minimising the impacts on riparian flora and fauna. In particular, strategies aimed at reducing fish deaths in the vicinity of the dam walls are to be instigated, provided such procedures do not adversely impact on other flood mitigation objectives.

Additionally, when determining the time interval between successive gate closures consideration should also be given to reducing potential bank slumping. Rapid draw down of stream levels where banks are saturated should be avoided if this can be managed within the other flood mitigation objectives.

D875

4 FLOOD CLASSIFICATION

For the reference purposes of this Manual, four magnitudes of flooding are classified as follows:

Minor Flooding

Causes inconvenience. Low-lying areas next to watercourses are inundated which may require the removal of stock and equipment. Minor roads may be closed and low-level bridges submerged.

Moderate Flooding

In addition to the impacts experienced during Minor Flooding, the evacuation of some houses may be required. Main traffic routes may be impacted. The area of inundation is substantial in rural areas requiring the removal of stock.

Major Flooding

In addition to the impacts experienced during Moderate Flooding, extensive rural areas and/or urban areas are inundated. Properties and towns are likely to be isolated and major traffic routes likely to be closed. Evacuation of people from flood affected areas may be required. The 1974 flood that impacted on the Ipswich and Brisbane areas is classified as a major flood.

Extreme Flooding

This causes flooding impacts equal to or in excess of levels previously experienced. In addition to the impacts experienced during Major Floods, the general evacuation of people from significant populated areas is likely to be required.

It should be noted that a flood may not cause the same category of flooding along its entire length and the relevant agencies shall have regard to this when flooding is predicted. The classifications of minor, moderate and major flooding are based on the Bureau of Meteorology Standard Flood Classifications for Australia.

The current classifications for key reference gauges in the Brisbane River are given in Appendix B.

D876

5 FLOOD MONITORING AND FORECASTING SYSTEM

5.1 General

A real time flood monitoring and forecasting system has been established in the dam catchments. This system employs radio telemetry to collect, transmit and receive rainfall and stream flow information. The system consists of more than 100 field stations that automatically record rainfall and/or river heights at selected locations in the dam catchments. Some of the field stations are owned by Seqwater with the remainder belonging to other agencies.

The rainfall and river height data is transmitted to Seqwater's Flood Operations Centre in real time. Once received in the Flood Operations Centre, the data is processed using a Real Time Flood Model (RTFM) to estimate likely dam inflows and evaluate a range of possible inflow scenarios based on forecast and potential rainfall in the dam catchments. The RTFM is a suite of hydrologic and hydraulic computer programs that utilise the real time data to assist in the operation of the dams during flood events. Seqwater is responsible for providing and maintaining the RTFM and for ensuring that sufficient data is available to allow proper operation of the RTFM during a Flood Event.

5.2 Operation

The Senior Flood Operations and Flood Operations Engineers use the RTFM for flood monitoring and forecasting during flood events to operate the dams in accordance with this Manual. This is done by optimising releases of water from the dams to minimise the impacts of flooding in accordance with the objectives and procedures contained in this Manual.

Seqwater is responsible for improving the operation of the RTFM over time by using the following processes:

- Implementing improvements based on Flood Event audits and reviews.
- Improving RTFM calibration as further data becomes available.
- Updating software in line with modern day standards.
- Improving the coverage and reliability of the data collection network to optimise data availability during Flood Events.
- Recommendations by Senior Flood Operations Engineers.

A regular process of internal audit and management review must be maintained by Seqwater to achieve these improvements.

Seqwater must also maintain a log of the performance of the data collection network. The log must include all revised field calibrations and changes to the number, type and locations of gauges. Senior Flood Operations and Flood Operations Engineers are to be notified of all significant changes to the Log.

D877

Seqwater must also maintain a log of the performance of the RTFM. Any faults to the computer hardware or software are to be noted and promptly and appropriately attend to.

5.3 Storage of Documentation

The performance of any flood monitoring and forecasting system is reliant on accurate historical data over a long period of time. Seqwater must ensure that all available data and other documentation is appropriately collected and catalogued for future use.

5.4 Key Reference Gauges

Key field station locations have been identified for reference purposes when flood information is exchanged between authorities or given to the public. Should it be deemed desirable to relocate field stations from these locations or vary flood classification levels, agreement must first be obtained between Seqwater, Bureau of Meteorology and the Local Government within whose boundaries the locations are situated.

Gauge boards that can be read manually must be maintained by Seqwater as part of the equipment of each key field station. Where possible and practical during Flood events, Seqwater is to have procedures in place for manual reading of these gauge boards in the event of failure of field stations.

5.5 Reference Gauge Values

Other agencies such as the Bureau of Meteorology, Brisbane City Council and Ipswich City Council have direct access to the information from field stations for flood assessment purposes. The consultation between agencies is a very important part of the assessment and prediction of flood flows and heights.

Seqwater must ensure that information relevant to the calibration of its field stations is shared with these agencies.

D878

6 COMMUNICATIONS

6.1 Communications between Staff

Seqwater is responsible for providing and maintaining equipment to allow adequate channels of communication to exist at all times between the Seqwater Flood Operations Centre and site staff at Wivenhoe and Somerset Dams.

6.2 Dissemination of Information

Agencies other than Seqwater have responsibilities for formal flood predictions, the interpretation of flood information and advice to the public associated with Flood Events. Adequate and timely information is to be supplied to agencies responsible for the operation of facilities affected by flooding and for providing warnings and information to the public. Agency information requirements are generally as shown in the table below.

The Senior Flood Operations and Flood Operations Engineers must supply information to each of these agencies during Flood Events. The contact information for these Agencies and communication procedures is contained in the Emergency Action Plans for the dams and each agency is to receive updated controlled copies of these documents.

Seqwater must liaise and consult with these agencies with a view to ensuring all information relative to the flood event is consistent and used in accordance with agreed responsibilities.

AGENCY INFORMATION REQUIREMENTS

Agency	Activity	Information Required from Flood Operations Centre	Trigger
Bureau of Meteorology	Issue of flood warnings for Brisbane River basin	Actual and projected discharges from Wivenhoe Dam Actual and projected discharges from Somerset Dam	Initial gate operations and thereafter at intervals to suit forecasting requirements
Department of Environment and Resource Management	Review of flood operations and discretionary powers	Actual and predicted lake levels and discharges	
Somerset Regional Council	Flood level information upstream of Somerset Dam and upstream and downstream of Wivenhoe Dam	Actual and predicted lake levels, Somerset Dam and actual and predicted lake levels and discharges, Wivenhoe Dam	Somerset Dam water level predicted to exceed EL 102 m AHD and initial Wivenhoe Dam gate operation
Ipswich City Council	Flood level information for Ipswich City area	Nil (information obtained from BOM)	
Brisbane City Council	Flood level information for Brisbane City area	Nil (information obtained from BOM)	

D879

6.3 Release of Information to the Public

Seqwater is responsible for the issue of information regarding storage conditions and current and proposed releases from the dams to the public and the media.

The Bureau of Meteorology has responsibility for issuing flood warnings.

The Emergency Services Response Authorities, under the Disaster Management Act 2003, have responsibility for the preparation of a local counter disaster plan and the interpretation of flood forecast information for inclusion in their local flood warnings prepared under the flood sub plan of the counter disaster plan.

D880

7 REVIEW

7.1 Introduction

With the passage of time neither the technical assumptions nor the physical conditions on which this Manual is based may remain unchanged. It is also recognised that the relevance of the Manual may change with changing circumstances. It is important therefore, that the Manual contain operational procedures which cause the assumptions and conditions upon which they are based, to be checked and reviewed regularly.

This process must involve all personnel involved in the management of Flood Events, to ensure that changes of personnel do not result in a diminished understanding of the basic principles upon which the operational procedures are based. Variations to the Manual may be made in accordance with provisions in Section 1.8.

7.2 Personnel Training

Seqwater must report to the Chief Executive by 30 September each year on the training and state of preparedness of operations personnel.

7.3 Monitoring and Forecasting System and Communication Networks

Seqwater must provide a report to the Chief Executive by 30 September each year on the state of the Flood Monitoring and Forecasting System and Communication Networks. The report must assess following in terms of hardware, software and personnel:

- Adequacy of the communication and data gathering facilities.
- Reliability of the system over the previous period.
- Reliability of the system under prolonged flood conditions.
- Accuracy of forecasting flood flows and heights.
- The overall state of preparedness of the system.

Seqwater must take any action considered necessary for the proper functioning and improvement of this system.

7.4 Operational Review

After each significant flood event, Seqwater must report to the Chief Executive on the effectiveness of the operational procedures contained in this manual. This report must be submitted within six weeks of any flood event that requires mobilisation of the Flood Operations Centre.

D881

7.5 Five Yearly Review

Prior to the expiry of the approval period, Seqwater must review the Manual pursuant to provisions of the Act. The review is to take into account the continued suitability of the communication network and the flood monitoring and forecasting system, as well as hydrological and hydraulic engineering assessments of the operational procedures.

D882

8 WIVENHOE DAM FLOOD OPERATIONS

8.1 Introduction

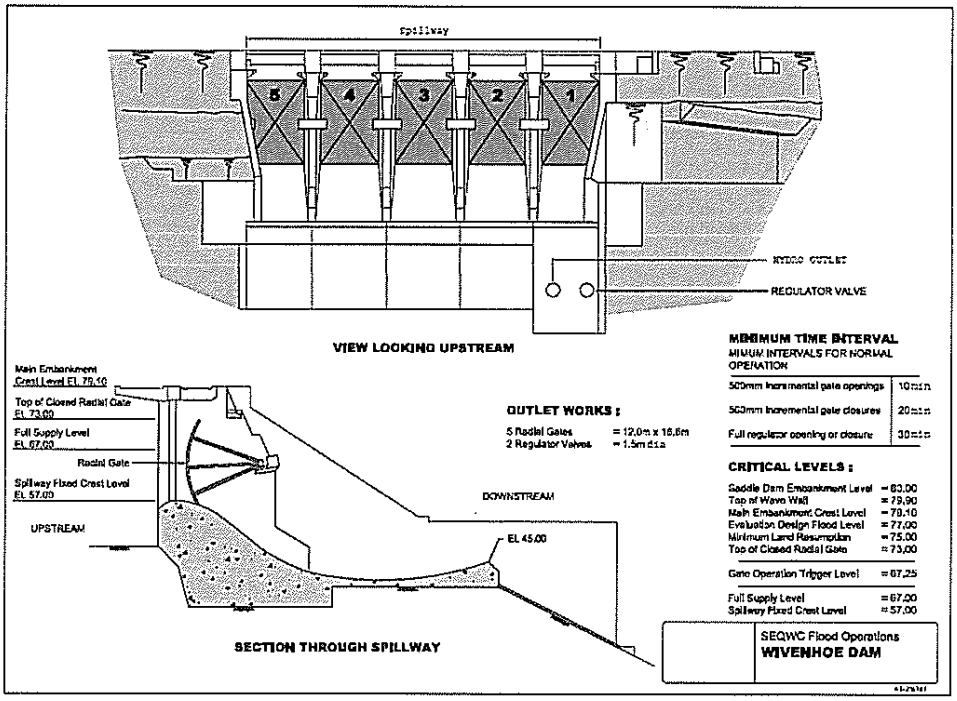
Wivenhoe Dam is capable of being operated in a number of ways to reduce flooding in the Brisbane River downstream of the dam, depending on the origin, magnitude and spatial extent of the flood. Maximum overall flood mitigation effect will be achieved by operating Wivenhoe Dam in conjunction with Somerset Dam.

The reservoir volume above FSL of EL 67.0 is available as temporary flood storage. How much of the available flood storage compartment is utilised, will depend on the initial reservoir level below FSL, the magnitude of the flood being regulated and the procedures adopted.

Splityard Creek Dam is part of the overall Wivenhoe Area Project and it forms the upper pumped storage for hydro power generation. Splityard Creek Dam impounds a volume of 28,700 ML at FSL (EL 166.5). This volume can be emptied into Lake Wivenhoe within 12 hours and this water can affect the level in Wivenhoe Dam by up to 300mm when Wivenhoe Dam is close to FSL. Operation of the power station and release of water from Splityard Creek Dam to Lake Wivenhoe is outside the control of Seqwater, but should be considered when assessing the various trigger levels of Wivenhoe Dam.

8.2 Flood Release Infrastructure

Radial Gates and an Auxiliary Spillway are the primary infrastructure used to release water during flood events at Wivenhoe Dam. The arrangement of the Radial Gates is shown in the diagram below:



D883

In addition to the five radial gates, the auxiliary spillway was constructed in 2005 as part of an upgrade to improve flood adequacy of this storage. The auxiliary spillway consists of a three bay fuse plug spillway at the right abutment. In association with other works constructed at the dam, this gives the dam crest flood an AEP of approximately 1 in 100,000. Another one bay fuse plug spillway may be constructed at Saddle Dam Two in the future.

Pertinent information about the auxiliary spillway, including the initiation level for the specific bays is given in the following table.

AUXILIARY SPILLWAY - FUSE PLUG DETAILS

Auxiliary Spillway Component	Spillway Type	Spillway Width	Spillway Crest Level	Fuse Plug Pilot Channel Invert Level	Storage Level corresponding to Fuse Plug Pilot Channel Invert Level*
		m	m AHD	m AHD	m AHD
Central Bay	Ogee	34.0	67	75.7	75.7
Right Side Bay	Ogee	64.5	67	76.2	76.23[+]
Left Side Bay	Ogee	65.5	67	76.7	76.78[++]

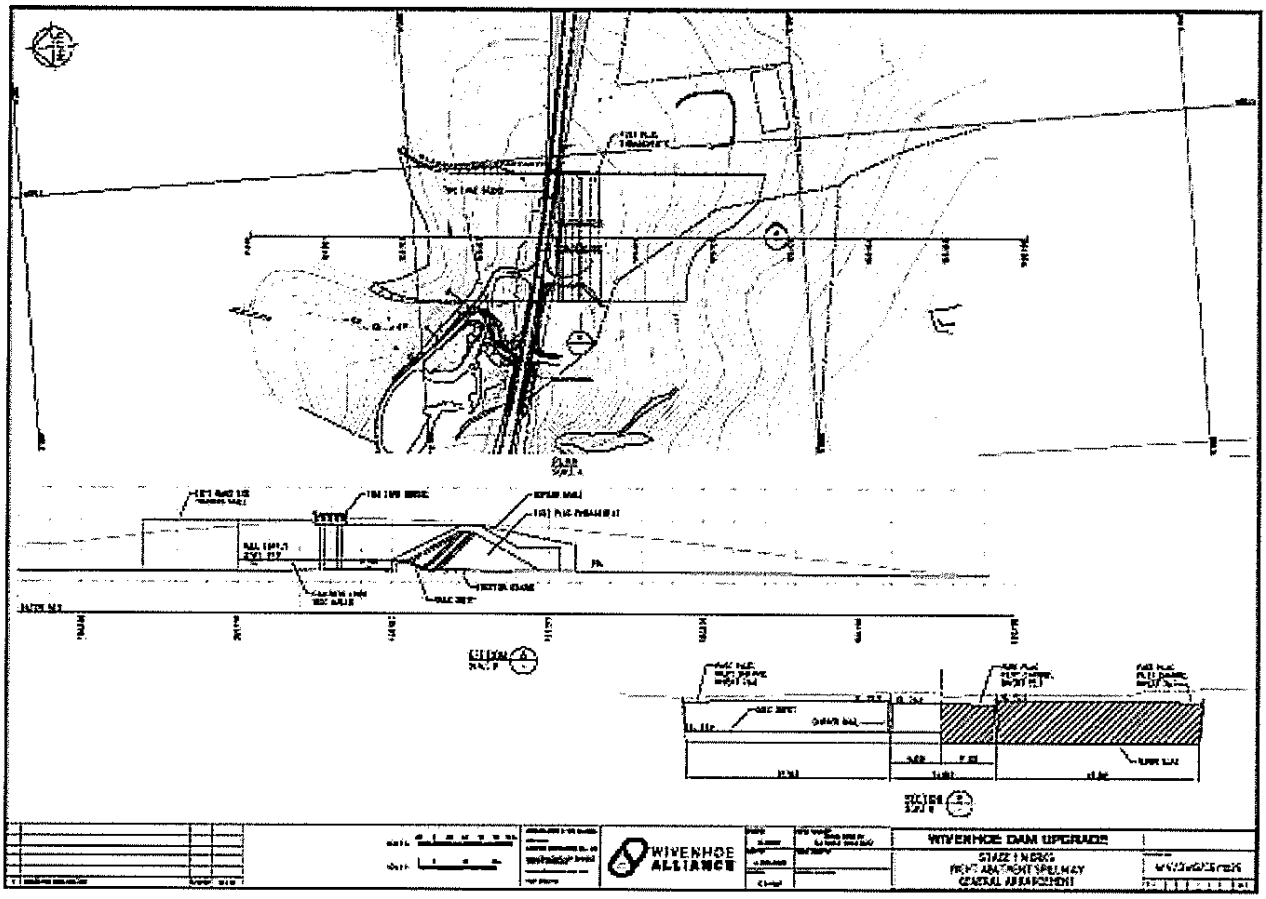
* Storage Level is as per that measured at the Headwater Gauge. Initiation of Fuse Plug is expected to occur when the Lake Water Level exceeds the Lake Level at Fuse Plug Pilot Channel by 0.10 - 0.15 m.

[+] Includes 0.03m of drawdown from the Fuse Plug Pilot Channel Invert to the Lake Water Level

[++] Includes 0.08m of drawdown from the Fuse Plug Pilot Channel Invert to the Lake Water Level

The arrangement of the Auxiliary Spillway is shown in the diagram below.

D884



8.3 Initial Flood Control Action

Once a Flood Event is declared, an assessment is to be made of the magnitude of the Flood Event, including:

- A prediction of the maximum storage levels in Wivenhoe and Somerset Dams.
- A prediction of the peak flow rate at the Lowood Gauge excluding Wivenhoe Dam releases.
- A prediction of the peak flow rate at the Moggill Gauge excluding Wivenhoe Dam releases.

The spillway gates are not to be opened for flood control purposes prior to the reservoir level exceeding EL 67.25.

D885

8.4 Flood Operations Strategies

There are four strategies (W1 to W4) used when operating Wivenhoe Dam during a flood event as outlined below. These strategies are based on the Flood Objectives of this manual. As outlined in Section 3, the objectives, listed in descending order of importance, are as follows:

- Ensure the structural safety of the dams;
- Provide optimum protection of urbanised areas from inundation;
- Minimise disruption to rural life in the valleys of the Brisbane and Stanley Rivers;
- Retain the storage at Full Supply Level at the conclusion of the Flood Event.
- Minimise impacts to riparian flora and fauna during the drain down phase of the Flood Event.

Within any strategy, consideration is always given to these objectives in this order, when making decisions on dam releases.

The strategy chosen at any point in time will depend on the actual levels in the dams and the following predictions, which are to be made using the best forecast rainfall and stream flow information available at the time:

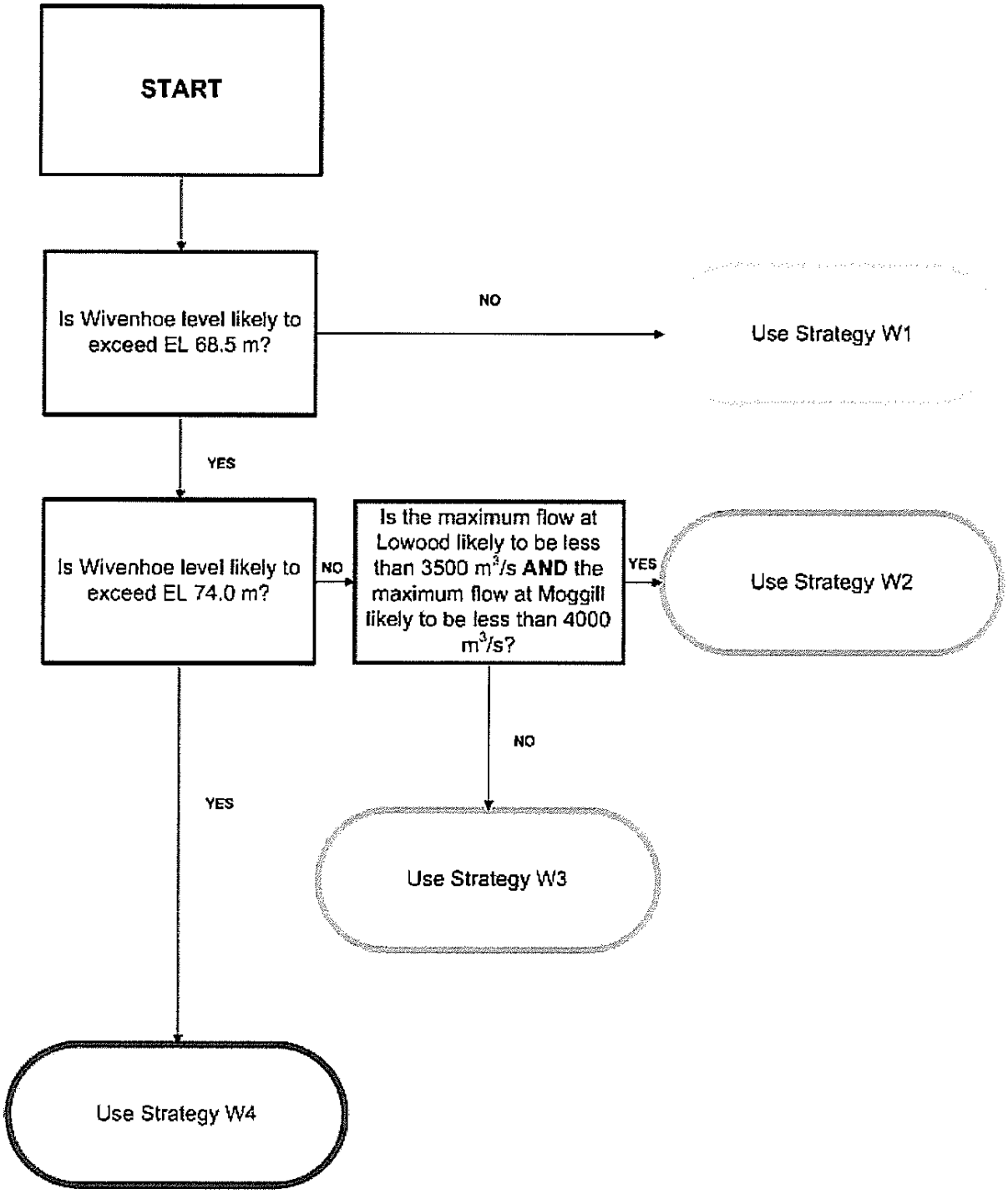
- Maximum storage levels in Wivenhoe and Somerset Dams.
- Peak flow rate at the Lowood Gauge (excluding Wivenhoe Dam releases).
- Peak flow rate at the Moggill Gauge (excluding Wivenhoe Dam releases).

Strategies are likely to change during a flood event as forecasts change and rain is received in the catchments. It is not possible to predict the range of strategies that will be used during the course of a flood event at the commencement of the event. Strategies are changed in response to changing rainfall forecasts and stream flow conditions to maximise the flood mitigation benefits of the dams.

When determining dam outflows within all strategies, peak outflow should generally not exceed peak inflow. A flowchart showing how best to select the appropriate strategy to use at any point in time is shown below:

D886

WIVENHOE FLOOD STRATEGY FLOW CHART

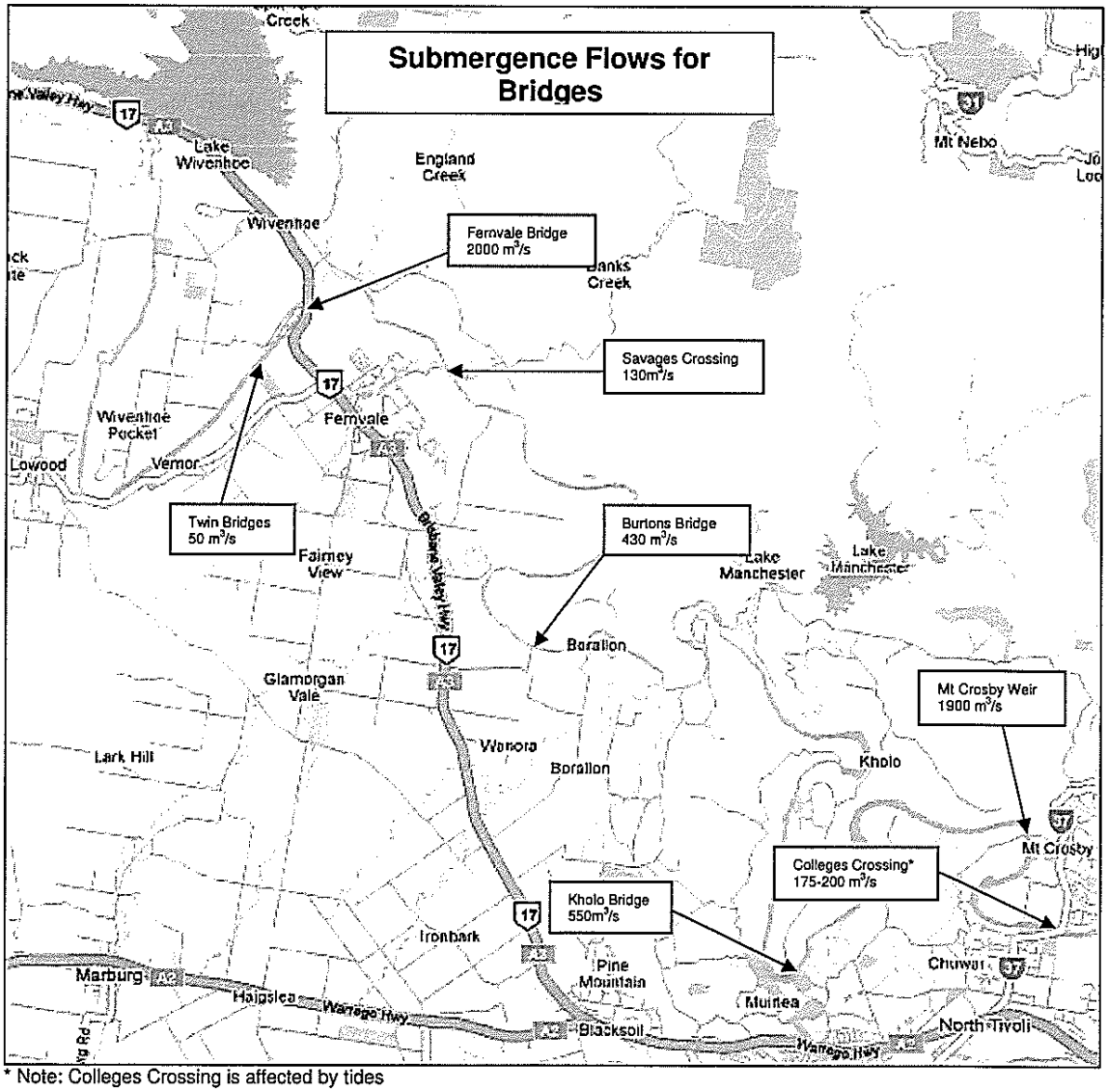


D887

Strategy W1 - The Primary Consideration is Minimising Disruption to Downstream Rural Life

Conditions	• **Wivenhoe Storage Level predicted to be less than 68.50 m AHD** • **Maximum release predicted to be less than 1,900 m^3/s** • **The primary consideration is minimising disruption to downstream rural life**

The intent of Strategy W1 is to not to submerge the bridges downstream of the dam prematurely (see Appendix I). The limiting condition for Strategy W1 is the submergence of Mt Crosby Weir Bridge that occurs at approximately 1,900 m^3/s.



* Note: Colleges Crossing is affected by tides

D888

For situations where flood rains are occurring on the catchment upstream of Wivenhoe Dam and only minor rainfall is occurring downstream of the dam, releases are to be regulated to limit, as much as appropriate in the circumstances, downstream flooding.

The following strategies require a great deal of control over releases and knowledge of discharges from Lockyer Creek. In general, the releases from Wivenhoe Dam are controlled such that the combined flow from Lockyer Creek and Wivenhoe Dam is less than the limiting values to delay the submergence of particular bridges. The diagram above shows the location of the impacted bridges and the approximate river flow rate at which they are closed to traffic.

Strategy W1A Twin Bridges, Savages Crossing and Colleges Crossing

Lake Level greater than 67.25 m AHD
[Maximum Release 110 m^3/s]

Firstly, endeavour to maintain Twin Bridges trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 50 m^3/s.

Once Twin Bridges is closed to traffic, endeavour to maintain Savages Crossing trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 110 m^3/s.

Once Savages Crossing is closed to traffic, endeavour to maintain College's Crossing trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 175 m^3/s. Note that College's Crossing can be impacted by tidal influences.

When the flood event subsides, all gates are to be closed when the dam achieves FSL in accordance with Section 8.5.

Strategy W1B College's Crossing and Burtons Bridge

Lake Level greater than 67.50 m AHD
[Maximum Release 380 m^3/s]

No consideration is given to maintaining Twin Bridges or Savages Crossing open.

Endeavour to maintain College's Crossing trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 175 m^3/s.

Once College's Crossing is closed to traffic, endeavour to maintain Burtons Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 430 m^3/s.

D889

Strategy W1C Burtons Bridge and Kholo Bridge

Lake Level greater than 67.75 m AHD
[Maximum Release 500 m^3/s]

No consideration is given to maintaining College's Crossing open.

Endeavour to maintain Burtons Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 430 m^3/s.

Once Burtons Bridge is closed to traffic, endeavour to maintain Kholo Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 550 m^3/s.

Strategy W1D Kholo Bridge and Mt Crosby Weir Bridge

Lake Level greater than 68.00 m AHD
[Maximum Release 1900 m^3/s]

No consideration is given to maintaining Burtons Bridge open.

Endeavour to maintain Kholo Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 550 m^3/s.

Once Kholo Bridge is closed to traffic, endeavour to maintain Mt Crosby Weir Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 1900 m^3/s.

Strategy W1E Mt Crosby Weir Bridge and Fernvale Bridge

Lake Level greater than 68.25 m AHD
[Maximum Release 1900 m^3/s]

No consideration is given to maintaining Kholo Bridge open.

Endeavour to maintain Mt Crosby Weir Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 1900 m^3/s.

Once Mt Crosby Weir Bridge is closed to traffic, endeavour to maintain Fernvale Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 2000 m^3/s.

If the level reaches EL 68.5 m AHD in Wivenhoe Dam, switch to Strategy W2 or W3 as appropriate.

D890

Strategy W2 - Strategy W2 is a Transition Strategy where the primary consideration changes from Minimising Impact to Downstream Rural Life to Protecting Urban Areas from Inundation.

Conditions	• **Wivenhoe Storage Level predicted to be between 68.50 and 74.00 m AHD** • **Maximum Release predicted to be less than 3,500 m^3/s** • **This is a transition strategy in which the primary consideration changes from minimising disruption to downstream rural life to protecting urban areas from inundation** • **Lower level objectives are still considered when making decisions on water releases. Objectives are always considered in order of importance**

The intent of Strategy W2 is limit the flow in the Brisbane River to less than the naturally occurring peaks at Lowood and Moggill, while remaining within the upper limit of non-damaging floods at Lowood (3,500 m^3/s). In these instances, the combined peak river flows should not exceed those shown in the following table:

LOCATION	TARGET MAXIMUM FLOW IN THE BRISBANE RIVER
Lowood	The lesser of: • the natural peak flow at Lowood excluding Wivenhoe Dam releases, and; • 3,500m^3/s.
Moggill	The lesser of: • the natural peak flow at Moggill excluding Wivenhoe Dam releases, and; • 4,000m^3/s.

D891

Strategy W3 – The primary consideration is Protecting Urban Areas from Inundation

Conditions	• **Wivenhoe Storage Level predicted to be between 68.50 and 74.00 m AHD** • **Maximum Release should not exceed 4,000 m^3/s** • **The primary consideration is protecting urban areas from inundation** • **Lower level objectives are still considered when making decisions on water releases. Objectives are always considered in order of importance**

The intent of Strategy W3 is to limit the flow in the Brisbane River at Moggill to less than 4000 m^3/s, noting that 4000 m^3/s at Moggill is the upper limit of non-damaging floods downstream. The combined peak river flow targets for Strategy W3 are shown in the following table. In relation to these targets, it should be noted that depending on natural flows from the Lockyer and Bremer catchments, it may not be possible to limit the flow at Moggill to below 4000 m^3/s. In these instances, the flow at Moggill is to be kept as low as possible.

TIMING	TARGET MAXIMUM FLOW IN THE BRISBANE RIVER
Prior to the naturally occurring peak at Moggill (excluding Wivenhoe Dam releases).	The flow at Moggill is to be minimised.
After the naturally occurring peak at Moggill (excluding Wivenhoe Dam releases).	The flow at Moggill is to be lowered to 4,000m^3/s as soon as possible.

D892

Strategy W4 – The primary consideration is Protecting the Structural Safety of the Dam

Conditions	• **Wivenhoe Storage Level predicted to exceed 74.00m AHD.** • **No limit on Maximum Release rate** • **The primary consideration is protecting the structural safety of the dam** • **Lower level objectives are still considered when making decisions on water releases. Objectives are always considered in order of importance**

The intent of Strategy W4 is to ensure the safety of the dam while limiting downstream impacts as much as possible.

This strategy normally comes into effect when the water level in Wivenhoe Dam reaches 74.0 m AHD. However the Senior Flood Operations Engineer may seek to invoke the discretionary powers of Section 2.8 if earlier commencement is able to prevent triggering of a fuse plug.

Under Strategy W4 the release rate is increased as the safety of the dam becomes the priority. Opening of the gates is to occur generally in accordance with the requirements of Section 8.6, until the storage level of Wivenhoe Dam begins to fall.

There are no restrictions on gate opening increments or gate operating frequency once the storage level exceeds 74.0 AHD, as the safety of the dam is of primary concern at these storage levels. However the impact of rapidly increasing discharge from Wivenhoe Dam on downstream reaches should be considered when determining gate opening sequences.

Strategy W4A – No Fuse Plug Initiation Expected

Lake Level between 74.0 and 75.5 m AHD
[No Maximum Release]

Strategy 4A applies while all indications of the peak flood level in Wivenhoe Dam are that it will be insufficient to trigger operation of the first bay of the fuse plug by reaching 75.5 m AHD.

Gate openings are generally to occur at the minimum intervals and sequences as specified in Section 8.6 until the storage level of Wivenhoe Dam begins to fall. However, to protect the safety of the dam, minimum opening intervals can be reduced and gate opening sequences can be modified.

D893

Strategy W4B – Fuse Plug Initiation Possible

Lake Level greater than 75.5 m AHD
[No Maximum Release]

Strategy W4B applies once indications are the peak flood level in Wivenhoe Dam may exceed EL75.5 and trigger the fuse plug under normal operations. Two scenarios are possible under this strategy. The first scenario is where it may be possible to prevent fuse plug initiation by early opening of the gates. The second scenario is where fuse plug initiation cannot be avoided. The actions associated with these scenarios are contained in the following table:

SCENARIO	ACTION
Potential to keep lake level below EL 75.5 by early opening of the gates and/or varying the operational procedures at Somerset.	The following actions can be used to prevent initiation of the fuse plug provided the safety of the dams is not compromised: • Retain water in Somerset Dam (See Somerset Dam Strategy S3 for guidelines). • Bring the gate operation sequence forward to increase discharge from the dam. In addition to dam safety issues, the impact of rapidly increasing discharge from Wivenhoe Dam on downstream reaches should be considered when determining the rate of gate openings.
Fuse plug initiation cannot be avoided.	PRIOR TO FUSE PLUG INITIATION If possible, the gates are to be raised at a rate to ensure they are out of the water before the initiation of the first fuse plug. The gates should be in the fully open position before the dam water level reaches 75.7 m AHD. FOLLOWING FUSE PLUG INITIATION The impact of rapidly changing discharge from Wivenhoe Dam on downstream reaches should be considered when determining the rate of gate closings in these circumstances. However, once a fuse plug is initiated, the flood storage at the dam is to be drained as quickly as possible within the gate closure sequence.

D894

8.5 Gate Closing Strategies

In general, gate closing commences when the level in Wivenhoe Dam begins to fall and is generally to occur in the reverse order to opening. The final gate closure should occur when the lake level has returned to Full Supply Level. The following requirements must be considered when determining gate closure sequences:

- Where possible, total releases during closure should not produce greater flood levels downstream than occurred during the flood event.
- The maximum discharge from the dam during closure should generally be less than the peak inflow into Wivenhoe Dam experienced during the event. The discharge from Wivenhoe Dam includes discharge from triggered fuse plugs, gates, regulator cone dispersion valve and hydro release.
- If, at the time the lake level in Wivenhoe Dam begins to fall, the combined flow at Lowood is in excess of 3,500 m^3/s then the combined flow at Lowood is to be reduced to 3,500 m^3/s as quickly as practicable.
- The aim should always be to empty stored floodwaters stored above EL 67.0m within seven days after the flood peak has passed through the dams. However, provided a favourable weather outlook is available, this requirement can be relaxed for the volume between EL 67.0m and EL 67.5m, to obtain positive environmental outcomes.
- If the flood storage compartments of Wivenhoe Dam and Somerset Dam can be emptied within seven days, the maximum flow in the Brisbane River at Lowood should not exceed 3,500 m^3/s.
- To minimise the stranding of fish downstream of the dam, final closure sequences should consider Seqwater policies relating to fish protection at the dam.

There may be a need to take into account base flow when determining final gate closure. This may mean that the lake level temporarily falls below Full Supply Level to provide for a full dam at the end of the Flood Event.

8.6 Gate Operation Sequences

Radial Gate Opening Operations

When dam outflows are less than 4,000 m^3/s, rapid opening of the radial gates can cause undesirable rapid rises in downstream river levels. Accordingly, when dam outflows are less than 4,000 m^3/s, the aim in opening radial gates is to operate the gates one at a time at intervals that will minimise adverse impacts on the river system. The table below shows the target minimum interval for gate operations in these circumstances. This target interval can be reduced if the gates are at risk of being overtopped or the safety of the dam is at risk.

D895

TARGET MINIMUM INTERVAL FOR RADIAL GATE OPENING (DOWNSTREAM RIVER FLOWS < 4000 m^3/s)

OPERATION	TIME INTERVAL BETWEEN SUCCESSIVE OPENING OF INDIVIDUAL GATES (mins)
Radial Gate opening of 500 mm	10

When dam outflows exceed 4,000 m^3/s, the impact of rapid gate openings on downstream water levels is reduced due to the already elevated river levels. Under these circumstances, the safety of the dam will generally be of primary concern and therefore there are no minimum gate opening intervals in these circumstances.

Under extreme circumstances, the mechanical capability of the radial gate operating system provides the facility to open each radial gate more than five metres within a one hour period. Accordingly, unless a mechanical breakdown is experienced, physical gate opening capability in unlikely to be a constraint in meeting projected outflow targets.

Radial Gate Closing Operations

When dam outflows are less than 4,000 m^3/s, rapid closure of the radial gates can cause adverse impacts to the river system. Accordingly, when dam outflows are less than 4,000 m^3/s, the aim in closing radial gates is to operate the gates one at a time at an interval that will minimise adverse impacts on the river system as outlined in the table below.

TARGET MINIMUM INTERVAL FOR RADIAL GATE CLOSURE

OPERATION	TIME INTERVAL BETWEEN SUCCESSIVE CLOSING OF INDIVIDUAL GATES (mins)
Radial Gate closure of 500 mm	20

When dam outflows exceed 4,000 m^3/s, the impact of rapid gate closings is reduced due to the already elevated river levels. However, given that the safety of the dam is unlikely to be at risk if decisions are made to close radial gates, the target of operating the gates one at a time in accordance with the time interval shown in the above table remains.

Rapid closure of radial gates is permissible however, when there is a requirement to preserve storage or to reduce downstream flooding. When determining gate closure sequences, consideration should also be given to following the calculated natural recession of the flood in the river to aim to ensure that the recession impacts are not greater than those that would have been experienced had the dam not been constructed.

D896

Protection of the Spillway Walls

The flip bucket spillway is designed to control the discharge from the reservoir and to dissipate the energy of the discharge. The flip throws the discharge clear of the concrete spillway structures and into a plunge pool where the energy is dissipated by turbulence. Under non-symmetric flow conditions or when Gates 1 and 5 are not operating, the discharge jet may impinge on the walls of the plunge pool. As these walls have been excavated into erodible sandstone rock, this impingement may cause non-predictable erosion. Upstream migration of this erosion is to be avoided. This can be achieved by operating Gates 1 and 5 to deflect the discharge away from the walls of the plunge pool.

Therefore in operating the spillway, the principles to be observed in order of priority are:

(i) The discharge jet into the plunge pool is not to impinge on the right or left walls of the plunge pool.

(ii) The flow in the spillway is to be symmetrical.

Normal Gate Operation Sequences

Under normal operation, only one gate is to be opened at any one time and the sequences shown in the table below are to be adopted. Generally gates are operated in the order of 3,2,4,1,5. Variations are allowed at any time to protect the structural safety of the dam.

It should also be noted that:

- Gates are numbered 1 to 5 from the left bank looking downstream
- Flow in spillway to be as symmetrical as possible.

RADIAL GATE OPENING SEQUENCES

Gate 1 Opening (m)	Gate 2 Opening (m)	Gate 3 Opening (m)	Gate 4 Opening (m)	Gate 5 Opening (m)	Gate Operated
-	-	-	-	-	-
0.0	0.0	0.0	0.0	0.0	-
0.0	0.0	0.5	0.0	0.0	3
0.0	0.0	1.0	0.0	0.0	3
0.0	0.0	1.5	0.0	0.0	3
0.0	0.0	2.0	0.0	0.0	3
0.0	0.0	2.5	0.0	0.0	3
0.0	0.0	3.0	0.0	0.0	3
0.0	0.0	3.5	0.0	0.0	3
0.0	0.5	3.5	0.0	0.0	2
0.0	0.5	3.5	0.5	0.0	4
0.0	0.5	4.0	0.5	0.0	3
0.0	1.0	4.0	0.5	0.0	2
0.0	1.0	4.0	1.0	0.0	4

D897

Gate 1 Opening (m)	Gate 2 Opening (m)	Gate 3 Opening (m)	Gate 4 Opening (m)	Gate 5 Opening (m)	Gate Operated
0.5	1.0	4.0	1.0	0.0	1
0.5	1.0	4.0	1.0	0.5	5
0.5	1.5	4.0	1.0	0.5	2
0.5	1.5	4.0	1.5	0.5	4
1.0	1.5	4.0	1.5	0.5	1
1.0	1.5	4.0	1.5	1.0	5
1.0	2.0	4.0	1.5	1.0	2
1.0	2.0	4.0	2.0	1.0	4
1.5	2.0	4.0	2.0	1.0	1
1.5	2.0	4.0	2.0	1.5	5
1.5	2.5	4.0	2.0	1.5	2
1.5	2.5	4.0	2.5	1.5	4
1.5	2.5	4.5	2.5	1.5	3
2.0	2.5	4.5	2.5	1.5	1
2.0	2.5	4.5	2.5	2.0	5
2.5	2.5	4.5	2.5	2.0	1
2.5	2.5	4.5	2.5	2.5	5
2.5	3.0	4.5	2.5	2.5	2
2.5	3.0	4.5	3.0	2.5	4
2.5	3.5	4.5	3.0	2.5	2
2.5	3.5	4.5	3.5	2.5	4
3.0	3.5	4.5	3.5	2.5	1
3.0	3.5	4.5	3.5	3.0	5
3.0	4.0	4.5	3.5	3.0	2
3.0	4.0	4.5	4.0	3.0	4
3.0	4.0	5.0	4.0	3.0	3
3.5	4.0	5.0	4.0	3.0	1
3.5	4.0	5.0	4.0	3.5	5
3.5	4.5	5.0	4.0	3.5	2
3.5	4.5	5.0	4.5	3.5	4
4.0	4.5	5.0	4.5	3.5	1
4.0	4.5	5.0	4.5	4.0	5
4.5	4.5	5.0	4.5	4.0	1
4.5	4.5	5.0	4.5	4.5	5
4.5	5.0	5.0	5.0	4.5	2,4
5.0	5.0	5.0	5.0	5.0	1,5
5.0	5.0	5.5	5.0	5.0	3
5.0	5.5	5.5	5.5	5.0	2,4
5.5	5.5	5.5	5.5	5.5	1,5
5.5	5.5	6.0	5.5	5.5	3
5.5	6.0	6.0	6.0	5.5	2,4
6.0	6.0	6.0	6.0	6.0	1,5
6.0	6.0	6.5	6.0	6.0	3
6.0	6.5	6.5	6.5	6.0	2,4
6.5	6.5	6.5	6.5	6.5	1,5
6.5	6.5	7.0	6.5	6.5	3
7.0	7.0	7.0	7.0	7.0	2,4,1,5

D898

Gate 1 Opening (m)	Gate 2 Opening (m)	Gate 3 Opening (m)	Gate 4 Opening (m)	Gate 5 Opening (m)	Gate Operated
7.5	7.5	7.5	7.5	7.5	3,2,4,1,5
8.0	8.0	8.0	8.0	8.0	3,2,4,1,5
8.5	8.5	8.5	8.5	8.5	3,2,4,1,5
9.0	9.0	9.0	9.0	9.0	3,2,4,1,5
9.5	9.5	9.5	9.5	9.5	3,2,4,1,5
10.0	10.0	10.0	10.0	10.0	3,2,4,1,5
11.0	11.0	11.0	11.0	11.0	3,2,4,1,5
12.0	12.0	12.0	12.0	12.0	3,2,4,1,5
13.0	13.0	13.0	13.0	13.0	3,2,4,1,5
14.0	14.0	14.0	14.0	14.0	3,2,4,1,5
15.0	15.0	15.0	15.0	15.0	3,2,4,1,5
17.5	17.5	17.5	17.5	17.5	3,2,4,1,5

During the initial opening or final closure sequences of gate operations it is permissible to replace the discharge through a gate by the immediate opening of a regulator valve (or the reverse operation). This allows for greater control of low flows.

Gate Failure or Malfunction Procedures

Gate operating procedures in the event of equipment failure are contained in Appendix G. If one or more gates are inoperable during the course of the flood event, the gate openings of the remaining gates are to be adjusted to provide the required discharge from the dam. These adjustments should ensure that:

- The impact of the flow on the sidewalls of the plunge pool should be minimised, and
- The flow in the spillway is as symmetrical as practicable.

Radial Gate Turbulence Considerations

Unless in the process of lifting the gates clear of the flow, the bottom edge of the radial gates must always be at least 500 millimetres below the release flow surface. Having the bottom edge of the gates closer to the release flow surface than 500 millimetres may cause unusual turbulence that could adversely impact on the gates. This procedure has never been undertaken in practice and should be observed closely when being undertaken. Variations to the procedure are allowed to protect the structural safety of the dam.

Lowering Radial Gates that have been lifted Clear of the Release Flow

When lowering radial gates that have been lifted clear of the release flow, the bottom edge of the gates must be lowered at least 500 millimetres into the flow. Lowering gates into the release flow less than this amount may cause unusual turbulence that could adversely impact on the gates. This procedure has never been undertaken in practice and should be observed closely

D899

when being undertaken. Variations to the procedure are allowed to protect the structural safety of the dam.

8.7 Modification to Flood Operating Procedures if a Fuse Plug Triggers

Where the operation of a fuse plug spillway bay has been triggered, the flood operation procedures are to be modified such that:

- The discharge from the triggered fuse plug is to be taken into account when determining total flood releases from the dam;
- The gates are to be operated, to the extent possible, so that the same discharge restrictions apply as would have if the fuse plug embankment was intact.

8.8 Modification to Flood Operating Procedures if a subsequent flood event occurs prior to the reconstruction of Triggered Fuse Plugs

Where the operation of any or all of the fuse plug spillway bays has been triggered and a flood event occurs before the fuse plug can be reinstated, the flood operation procedures are to be modified such that:

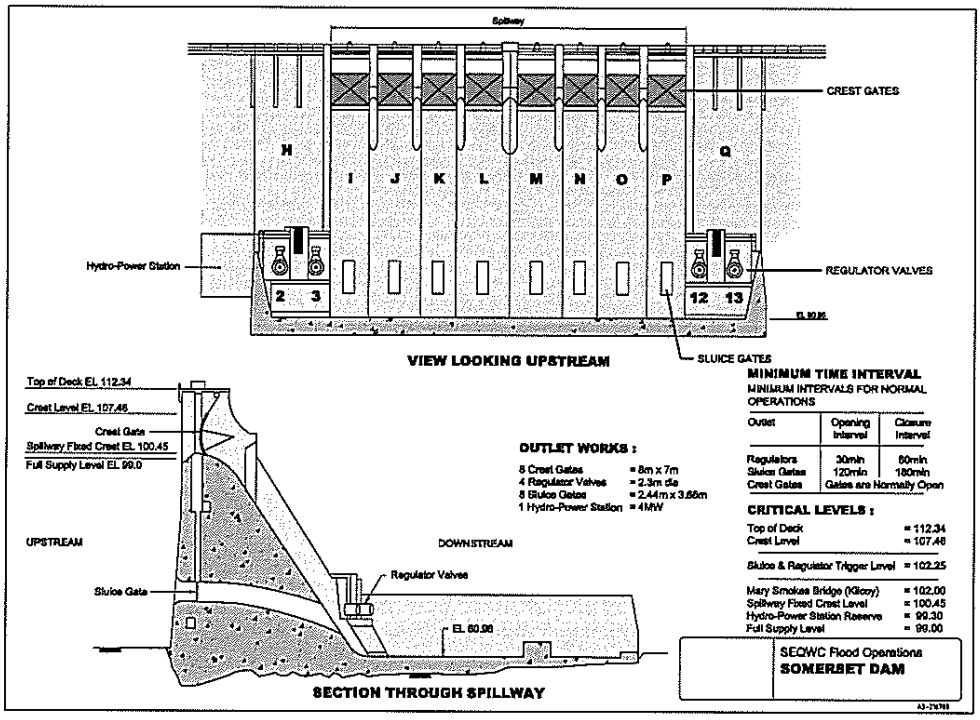
- The discharge from the triggered fuse plug is to be taken into account when determining total flood releases from the dam;
- The gates are to be operated, to the extent possible, so that the same discharge restrictions apply as would have if the fuse plug embankment was intact.
- Discharge from the Auxiliary Spillway will occur before the Gate Trigger Level of EL 67.25 m AHD. This flow should be taken into account when applying the flood operation strategies relevant to the low level bridge crossings.

D900

9 SOMERSET DAM FLOOD OPERATIONS

9.1 Introduction

Somerset Dam is capable of being operated in a number of ways to regulate Stanley River floods. Somerset Dam and Wivenhoe Dam are to be operated in conjunction to optimise the flood mitigation benefits downstream of Wivenhoe Dam. The arrangement of the Somerset Dam Radial Gates, Sluice Gates and Regulator Valves is shown in the diagram below. At EL 107.45, flood waters commence to flow over the dam crest. To account for this discharge, the dam crest is assumed to operate as a broad crested weir with a spillway width of 135.33 m:



9.2 Initial Flood Control Action

Once a Flood Event is declared, all radial gates are to be fully opened and all sluice gates and regulator valves are to be fully closed. An assessment is to be made of the magnitude of the Flood Event, including a prediction of the maximum storage levels in Wivenhoe and Somerset Dams.

9.3 Flood Operations Strategies

There are three strategies used when operating Somerset Dam during a flood event as outlined below. These strategies are based on the Flood Objectives of this manual. The strategy chosen at any point in time will depend on predictions of the maximum storage levels in Wivenhoe and Somerset Dams which are to be made using the best forecast rainfall and stream flow information available at the time.

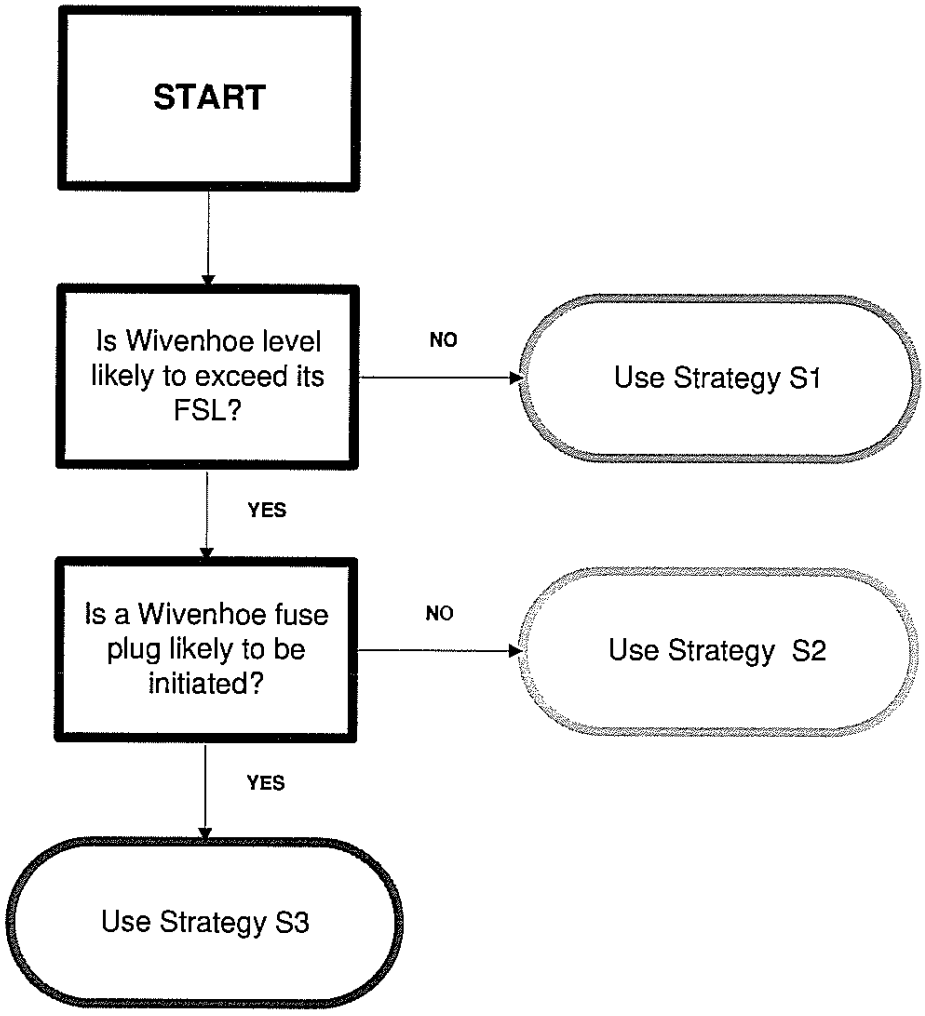
D901

Strategies are likely to change during a flood event as forecasts change and rain is received in the catchments. It is not possible to predict the range of strategies that will be used during the course of a flood event at the commencement of the event. Strategies are changed in response to changing rainfall forecasts and stream flow conditions to maximise the flood mitigation benefits of the dams.

When calculating the impacts of flood releases from Somerset Dam, the gate opening sequences outlined in Section 9.5 should be used to determine likely outflow rates from the dam.

A flowchart showing how best to select the appropriate strategy to use at any point in time is shown below:

SOMERSET FLOOD STRATEGY FLOW CHART



The order of operation for opening the sluices under each strategy is LMKNJOIP. Sluices are to be closed in reverse order of opening. Any inoperable sluices are to be dropped from the opening or closing sequences.

D902

Strategy S1 – Minimising Impact on Rural Life Upstream

Conditions	• **Somerset Dam Level expected to exceed EL 99.0 and Wivenhoe Dam not expected to reach EL 67.0 (FSL) during the course of the Flood Event**

The intent of this strategy is to return the dam to full supply level while minimising the impact on rural life upstream of the dam. Consideration is also given to minimising the downstream environmental impacts from the release.

The crest gates at Somerset Dam are raised to enable uncontrolled discharge. The Regulator Valves and Sluice gates are to be used to maintain the level in Somerset dam below EL 102.0 (deck level of Mary Smokes Bridge). The release rate from Somerset dam is not to exceed the peak inflow into the dam.

Strategy S2 – Minimise Impacts below Wivenhoe Dam

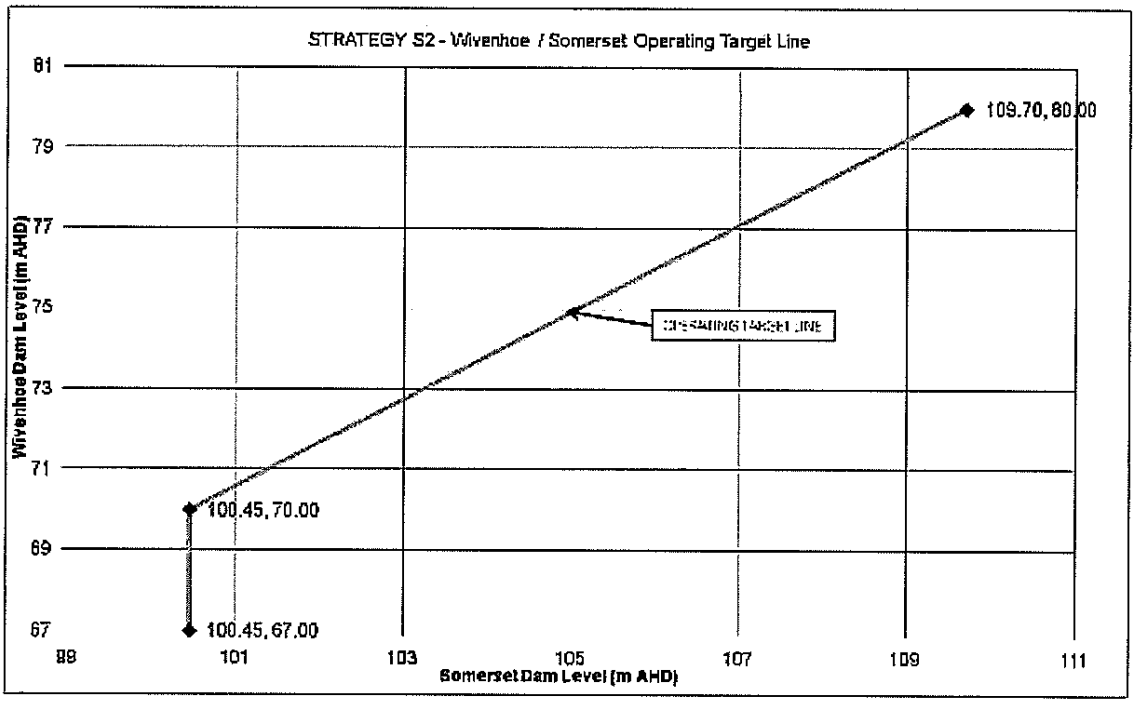
Conditions	• **Somerset Dam Level expected to exceed EL 99.0 and Wivenhoe Dam level expected to exceed EL 67.0 (FSL) but not exceed EL 75.5 (fuse plug initiation) during the course of the Flood Event.**

The intent of this strategy is to maximise the benefits of the flood storage capabilities of the dam while protecting the structural safety of both dams. The table below contains the operating conditions and actions for Strategy S2.

CONDITION	ACTION
Wivenhoe rising and Somerset level below EL 100.45.	The crest gates are raised to enable uncontrolled discharge. The low level regulators and sluices are generally kept closed.
Wivenhoe rising and Somerset level above EL 100.45.	The crest gates are raised to enable uncontrolled discharge. Operations are to target a correlation of water levels in Somerset Dam and Wivenhoe Dam as set out in the graph below. The operations target line shown on this graph is to generally be followed as the flood event progresses. The release rate from Somerset Dam is generally not to exceed the peak inflow into the dam.

D903

Wivenhoe falling and Somerset level above EL 100.45.	The opening of the regulators and sluices generally should not cause Wivenhoe Dam to rise significantly. The release rate from Somerset Dam is generally not to exceed the peak inflow into the dam.
The Flood Event has emanated mainly from the Stanley River catchment without significant runoff in the Upper Brisbane River catchment	The crest gates at Somerset Dam are raised to enable uncontrolled discharge. The Regulator Valves and Sluice gates are to be used to maintain the level in Somerset dam below EL 102.0 (deck level of Mary Smokes Bridge). The release rate from Somerset Dam is generally not to exceed the peak inflow into the dam.



Notes:

- The Operating Target Line was selected following an optimisation study. The Target Line was selected based on the following factors:
    - Equal minimisation of flood level peaks in both dams in relation to their associated dam failure levels.
    - Minimisation of flows in the Brisbane River downstream of Wivenhoe Dam.
    - Consideration of the time needed at the onset of a Flood Event to properly assess the magnitude of the event and the likely impacts, so that the likely optimal strategy to maximise the Flood Mitigation benefits of the storages can be selected.
- The levels of 109.70 m AHD and 80.00 m AHD represent the likely failure level for Somerset Dam and the level at the top of the Wivenhoe Dam Wave Wall respectively. Note that the failure level of 109.70 m AHD for Somerset Dam assumes all radial gates are fully open and this failure level will be reduced if this cannot be achieved.

D904

- The target point on the operating target line at any point in time is based on the maximum storage levels in Wivenhoe and Somerset Dams using the best forecast rainfall and stream flow information available at the time.
- Gate operations will enable the movement of the duty point towards the target line in a progressive manner. It will not necessarily be possible to adjust the duty point directly towards the target line in a single gate operation.

Strategy S3 - Protect the Structural Safety of the Dam	
Conditions	• **Somerset Dam Level expected to exceed EL 99.0 and Wivenhoe Dam level expected to exceed EL 75.5 (fuse plug initiation) during the course of the Flood Event.**

The intent of this strategy is to maximise the benefits of the flood storage capabilities of the dam while protecting the structural safety of both dams.

In addition to the operating protocols used in Strategy S2, to prevent fuse plug initiation, consideration can be given to temporary departure from the operating protocols contained in this strategy under the following conditions:

- The safety of Somerset Dam is the primary consideration and cannot be compromised.
- The peak level in Somerset dam cannot exceed EL 109.7.

9.4 Gate Closing Strategies

In general, gate closing commences when the level in Somerset Dam begins to fall and is generally to occur in the reverse order to opening. The final gate closure should occur when the lake level has returned to Full Supply Level. The following requirements must be considered when determining gate closure sequences:

- Unless determined otherwise by the Senior Flood Operations Engineer in accordance with Section 2.8, the aim should be to empty stored floodwaters within seven days after the flood peak has passed through the dams.
- To minimise the stranding of fish downstream of the dam, final closure sequences should consider Seqwater policies relating to fish protection at the dam.

There may be a need to take into account base flow when determining final gate closure. This may mean that the lake level temporarily falls below Full Supply Level to provide for a full dam at the end of the Flood Event.

D905

9.5 Gate Operation Sequences

Intervals between Operations

Releases from Somerset Dam flow directly into Wivenhoe Dam and therefore the downstream river impact considerations associated with radial gate operations at Wivenhoe Dam, do not directly apply to Somerset Dam. However, the following minimum intervals should generally be observed whilst opening and closing regulators, sluices and crest gates at Somerset Dam for flood mitigation purposes. These intervals have been chosen to minimise any adverse impacts caused by lake level rises above the junction of the Stanley and Brisbane Rivers.

MINIMUM INTERVALS FOR NORMAL GATE OPERATIONS

ITEM	OPENING	CLOSING
Regulator Valves	30 mins	60 mins
Sluice Gates (Dam level < EL 100.45)	120 mins	180 mins
Sluice Gates (Dam level > EL 100.45)	60 mins	60 mins
Crest Gates	Gates are normally open	-

Sluice Gate Operations

The order of operation for opening the sluices under each strategy is LMKNJOIP. Sluices are to be closed in reverse order of opening. Any inoperable sluices are to be dropped from the opening or closing sequences.

Regulator Valve Considerations

During the initial opening or final closure sequences of gate operations it is permissible to replace the discharge through a sluice gate by the immediate opening of one or more regulator valves (or the reverse operation). This allows for greater control of low flows and enables a smooth transition on opening and closing sequences.

It must also be noted that the Regulator Valves are not to be operated when the tail water level below Somerset Dam is above the invert of the valves (68.60 m AHD). Operating the valves under these circumstances can damage the valves. This requirement can be ignored if the structural safety of the dam is at risk.

D906

10 EMERGENCY FLOOD OPERATIONS

10.1 Introduction

While every care has been exercised in the design and construction of the dams, there still remains a low risk that the dams may develop an emergency condition either through flood events or other causes. Vigilance is required to recognise emergency flood conditions such as:

- Occurrence of a much larger flood than the discharge capacity of the dam;
- Occurrence of a series of large storms in a short period;
- Failure of one or more gates during a flood.
- Development of a piping failure through the embankment of Wivenhoe Dam;
- Damage to the dams by earthquake;
- Damage to the dams as an act of war or terrorism;

Responses to these conditions are included in Emergency Action Plans for the dams.

10.2 Overtopping of Dams

Whatever the circumstances, every endeavour must be made to prevent overtopping of Wivenhoe Dam by the progressive opening of operative spillway gates. The Auxiliary Spillway constructed at the dam in 2005 gives the dam crest flood an AEP of approximately 1 in 100,000. Another one bay fuse plug spillway may be constructed at Saddle Dam Two in the future, thereby increasing this immunity.

Somerset Dam should not be overtopped by flood water, but if Wivenhoe Dam is threatened by overtopping, the release of water from Somerset Dam is to be reduced at the risk of overtopping Somerset Dam in order to prevent the overtopping of Wivenhoe Dam.

10.3 Communications Failure

If communications are lost between the Flood Operations Centre and either dam, the officers in charge at each dam are to adopt the procedures set out below.

Wivenhoe Dam Emergency Procedure

In the event of communications loss with the Flood Operations Centre, the Dam Supervisor at Wivenhoe Dam is to assume responsibility for flood releases from the Dam. Once it has been established that communications have been lost, the Dam Supervisor at Wivenhoe Dam is to:-

- Take all practicable measures to restore communications and periodically check the lines of communication for any change;

D907

- Follow the procedures set out below to determine the relevant magnitude and duration of releases from Wivenhoe Dam;
- Log all actions in the Event Log;
- Ensure the dam is at full supply level at the end of the event;
- Remain in the general vicinity of the dam while on duty.

The radial gate opening sequence is as set out in Table 10.2. Individual sequence steps are shown against a target storage level. The minimum time intervals between each step in the radial gate opening sequence are shown in Table 10.1. Falling behind or being in front of the target gate openings is permissible when the storage level is less than 74.0 m AHD, but not allowed when the storage level is greater than 74.0 m AHD. When the storage level is below 74.0 m AHD, the operating intervals shown in Table 10.1 must generally be followed and can be ignored only to protect the structural safety of the dam.

Where the operation of a fuse plug spillway bay has been triggered, the relevant table contained in Appendix J is to be substituted for Table 10.2.

TABLE 10.1
MINIMUM INTERVALS BETWEEN OPERATING SEQUENCE STEPS

ITEM	MINIMUM OPENING INTERVAL	MINIMUM CLOSING INTERVAL
Radial Gates (Dam Level < EL 74.0)	10 mins	20 mins
Radial Gates (Dam Level > EL 74.0)	No Minimum	No Minimum

TABLE 10.2
RADIAL GATE OPENING SEQUENCE STEPS AND TARGET GATE OPENINGS AGAINST STORAGE LEVEL

Storage Level	Gate 1 Opening	Gate 2 Opening	Gate 3 Opening	Gate 4 Opening	Gate 5 Opening	Total Opening	Discharge	Gate Operated
m AHD	(m)	(m)	(m)	(m)	(m)	(m)	(m^3/s)	
67.00	-	-	-	-	-	-		
67.25	0.0	0.0	0.0	0.0	0.0	0	0	
67.50	0.0	0.0	0.5	0.0	0.0	0.5	50	3
67.75	0.0	0.0	1.0	0.0	0.0	1.0	100	3
68.00	0.0	0.0	1.5	0.0	0.0	1.5	150	3
68.25	0.0	0.0	2.0	0.0	0.0	2.0	210	3
68.50	0.0	0.0	2.5	0.0	0.0	2.5	260	3
68.65	0.0	0.0	3.0	0.0	0.0	3.0	310	3

D908

TABLE 10.2 (CONTINUED)

Storage Level	Gate 1 Opening	Gate 2 Opening	Gate 3 Opening	Gate 4 Opening	Gate 5 Opening	Total Opening	Discharge	Gate Operated
m AHD	(m)	(m)	(m)	(m)	(m)	(m)	(m^3/s)	
68.80	0.0	0.0	3.5	0.0	0.0	3.5	360	3
68.95	0.0	0.5	3.5	0.0	0.0	4.0	430	2
69.10	0.0	0.5	3.5	0.5	0.0	4.5	470	4
69.25	0.0	0.5	4.0	0.5	0.0	5.0	520	3
69.40	0.0	1.0	4.0	0.5	0.0	5.5	570	2
69.55	0.0	1.0	4.0	1.0	0.0	6.0	640	4
69.70	0.5	1.0	4.0	1.0	0.0	6.5	700	1
69.85	0.5	1.0	4.0	1.0	0.5	7.0	760	5
70.00	0.5	1.5	4.0	1.0	0.5	7.5	820	2
70.15	0.5	1.5	4.0	1.5	0.5	8.0	880	4
70.30	1.0	1.5	4.0	1.5	0.5	8.5	940	1
70.45	1.0	1.5	4.0	1.5	1.0	9.0	1,000	5
70.60	1.0	2.0	4.0	1.5	1.0	9.5	1,070	2
70.70	1.0	2.0	4.0	2.0	1.0	10.0	1,130	4
70.80	1.5	2.0	4.0	2.0	1.0	10.5	1,190	1
70.90	1.5	2.0	4.0	2.0	1.5	11.0	1,250	5
71.00	1.5	2.5	4.0	2.0	1.5	11.5	1,310	2
71.10	1.5	2.5	4.0	2.5	1.5	12.0	1,370	4
71.20	1.5	2.5	4.5	2.5	1.5	12.5	1,430	3
71.30	2.0	2.5	4.5	2.5	1.5	13.0	1,500	1
71.40	2.0	2.5	4.5	2.5	2.0	13.5	1,560	5
71.50	2.5	2.5	4.5	2.5	2.0	14.0	1,620	1
71.60	2.5	2.5	4.5	2.5	2.5	14.5	1,680	5
71.70	2.5	3.0	4.5	2.5	2.5	15.0	1,750	2
71.80	2.5	3.0	4.5	3.0	2.5	15.5	1,810	4
71.90	2.5	3.5	4.5	3.0	2.5	16.0	1,870	2
72.00	2.5	3.5	4.5	3.5	2.5	16.5	1,930	4
72.10	3.0	3.5	4.5	3.5	2.5	17.0	2,000	1
72.20	3.0	3.5	4.5	3.5	3.0	17.5	2,060	5
72.30	3.0	4.0	4.5	3.5	3.0	18.0	2,130	2
72.40	3.0	4.0	4.5	4.0	3.0	18.5	2,190	4
72.50	3.0	4.0	5.0	4.0	3.0	19.0	2,250	3
72.55	3.5	4.0	5.0	4.0	3.0	19.5	2,310	1
72.60	3.5	4.0	5.0	4.0	3.5	20.0	2,370	5
72.65	3.5	4.5	5.0	4.0	3.5	20.5	2,430	2
72.70	3.5	4.5	5.0	4.5	3.5	21.0	2,490	4
72.75	4.0	4.5	5.0	4.5	3.5	21.5	2,550	1
72.80	4.0	4.5	5.0	4.5	4.0	22.0	2610	5
72.85	4.5	4.5	5.0	4.5	4.0	22.5	2670	1
72.90	4.5	4.5	5.0	4.5	4.5	23.0	2740	5
72.95	4.5	5.0	5.0	5.0	4.5	24.0	2850	2,4
73.00	5.0	5.0	5.0	5.0	5.0	25.0	2970	1,5
73.10	5.0	5.0	5.5	5.0	5.0	25.5	3030	3
73.20	5.0	5.5	5.5	5.5	5.0	26.5	3130	2,4

D909

TABLE 10.2 (CONTINUED)

Storage Level	Gate 1 Opening	Gate 2 Opening	Gate 3 Opening	Gate 4 Opening	Gate 5 Opening	Total Opening	Discharge	Gate Operated
m AHD	(m)	(m)	(m)	(m)	(m)	(m)	(m^3/s)	
73.30	5.5	5.5	5.5	5.5	5.5	27.5	3280	1,5
73.40	5.5	5.5	6.0	5.5	5.5	28.0	3340	3
73.50	5.5	6.0	6.0	6.0	5.5	29.0	3460	2,4
73.60	6.0	6.0	6.0	6.0	6.0	30.0	3590	1,5
73.70	6.0	6.0	6.5	6.0	6.0	30.5	3680	3
73.80	6.0	6.5	6.5	6.5	6.0	31.5	3780	2,4
73.90	6.5	6.5	6.5	6.5	6.5	32.5	3900	1,5
74.00	6.5	6.5	7.0	6.5	6.5	33.0	3970	3
74.10	7.0	7.0	7.0	7.0	7.0	35.0	4210	1,2,4,5
74.20	7.5	7.5	7.5	7.5	7.5	37.5	4510	1,2,3,4,5
74.30	8.0	8.0	8.0	8.0	8.0	40.0	4810	1,2,3,4,5
74.40	8.5	8.5	8.5	8.5	8.5	42.5	5110	1,2,3,4,5
74.50	9.0	9.0	9.0	9.0	9.0	45.0	5430	1,2,3,4,5
74.60	9.5	9.5	9.5	9.5	9.5	47.5	5750	1,2,3,4,5
74.70	10.0	10.0	10.0	10.0	10.0	50.0	6070	1,2,3,4,5
74.80	11.0	11.0	11.0	11.0	11.0	55.0	6740	1,2,3,4,5
74.90	12.0	12.0	12.0	12.0	12.0	60.0	7440	1,2,3,4,5
75.00	13.0	13.0	13.0	13.0	13.0	65.0	8200	1,2,3,4,5
75.10	14.0	14.0	14.0	14.0	14.0	70.0	9010	1,2,3,4,5
75.20	15.0	15.0	15.0	15.0	15.0	75.0	9880	1,2,3,4,5
75.30	17.5	17.5	17.5	17.5	17.5	Fully Open	10160	1,2,3,4,5
≥75.40	17.5	17.5	17.5	17.5	17.5	Fully Open	10250	
75.50	17.5	17.5	17.5	17.5	17.5	Fully Open	10340	

Under extreme circumstances, the mechanical capability of the gate operating system allows the facility to open each radial gate more than five metres within a one hour period. Accordingly, unless a mechanical breakdown is experienced, physical gate opening capability in unlikely to be a constraint in meeting projected gate opening targets. However in a loss of communications scenario, when extreme rises in lake level are being experienced, dam operators will have difficulty in continually matching minimum gate settings to lake level. Accordingly, in these circumstances when the dam level exceeds 74.0 AHD, it is permissible to estimate target dam levels one hour in advance, based on lake level rises in the previous hour and undertake gate operations on this basis.

In the event of one or more radial gates becoming jammed, the remaining gates are to be operated to provide the same total opening for a particular storage level, as shown in the Table 10.2. In these circumstances, gates are generally operated in the order of 3,2,4,1,5, moving through the sequence shown in the table.

In a loss of communication scenario, the bulkhead gate is only to be used to prevent a situation occurring which could endanger the safety of the dam. At the end of the event, the full supply level of the storage is to be achieved.

D910

Somerset Dam Emergency Procedure

In the event of communications loss with the Flood Operations Centre, the Dam Supervisor at Somerset Dam is to assume responsibility for flood releases from the Dam. Once it has been established that communications have been lost, the Dam Supervisor at Somerset Dam is to:

- Take all practicable measures to restore communications and periodically check the lines of communication for any change;
- Undertake the actions set out below to release flood water from Somerset Dam;
- Log all actions in the Event Log;
- Ensure the dam is at full supply level at the end of the event;
- Remain in the general vicinity of the dam while on duty.

The actions to be undertaken to release flood water are:

- If communications with Wivenhoe Dam are lost, the level in Wivenhoe Dam is to be assumed as the level shown on gauge boards located downstream of Somerset Dam.
- The radial gates are to be kept raised to allow uncontrolled discharge.
- The regulators are to be closed if the tail water level exceeds EL 68.60 and are generally kept closed. The only exception to this is if the regulators are used to prevent overtopping of the dam.
- Sluice gates are operated as either fully opened or fully closed. The order of operation for opening the sluice gates is LMKNJOIP. Sluices are to be closed in reverse order of opening. Any inoperable sluices are to be dropped from the opening or closing sequences. The sluice gates are to be operated in accordance with the following procedures:
    - **Case 1** - the level in Somerset Dam is below EL 100.45; or
    - **Case 2** - the level in Somerset Dam is above EL 100.45.

  These procedures are described below.

Case 1 Procedure (Level in Somerset Dam is below EL 100.45)

The sluice gates are to be operated in accordance with the following table:

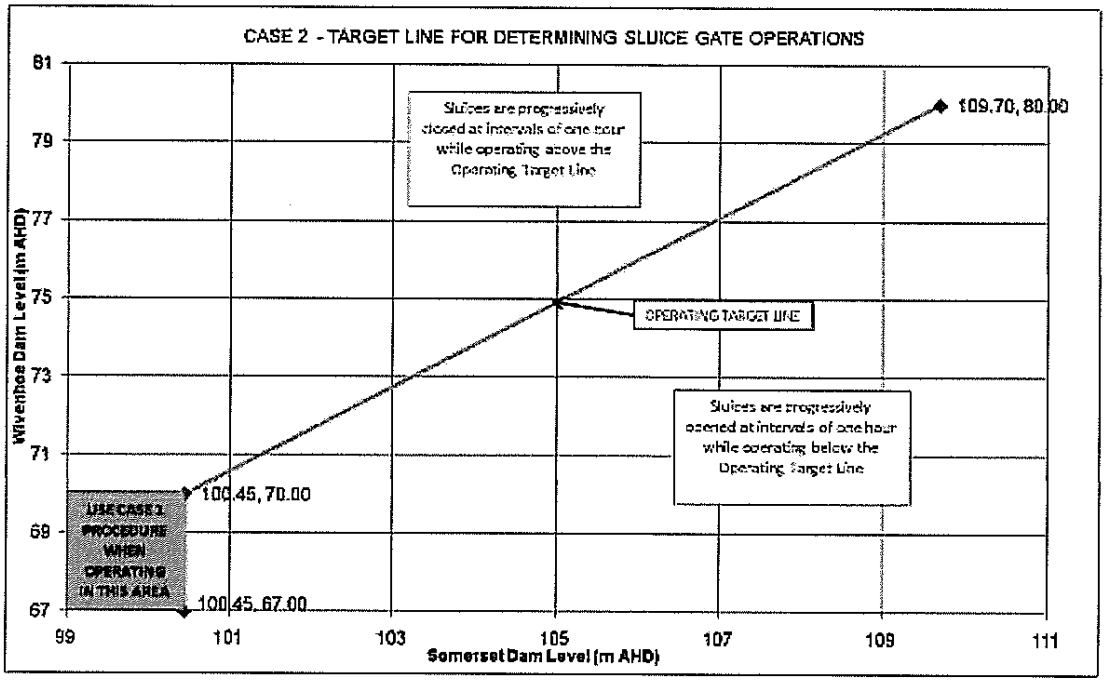
SOMERSET DAM LOSS OF COMMUNICATIONS CASE 1 PROCEDURE	
CONDITIONS AT SOMERSET AND WIVENHOE DAMS	**ACTIONS**
Level in Somerset Dam is below EL 100.45, Level in Wivenhoe Dam is below EL 70.0 and falling.	Sluice gates are to be opened at intervals of not less than 120 minutes, provided the number of open sluice gates does not exceed that shown in the "**SOMERSET DAM - MAXIMUM SLUICE GATE OPENING**" table. Once a sluice gate is opened, no further sluice gate operations are to be undertaken for 120 minutes.
Level in Somerset Dam is below EL 100.45, Level in Wivenhoe Dam is below EL 70.0 and rising.	Sluice gates are to be closed at intervals of not less than 180 minutes. Once a sluice gate is closed, no further sluice gate operations are to be undertaken for 180 minutes.
Level in Somerset Dam is below EL 100.45, Level in Wivenhoe Dam is above EL 70.0.	Sluice gates are to be closed at intervals of not less than 60 minutes. Once a sluice gate is closed, no further sluice gate operations are to be undertaken for 60 minutes.

SOMERSET DAM MAXIMUM SLUICE GATE OPENING	
SOMERSET DAM LEVEL	**MAXIMUM NUMBER OF SLUICE GATES ALLOWED TO BE OPEN**
99.00	0
99.05	1
99.15	2
99.31	3
99.51	4
99.75	5
100.04	6
100.37	7
>100.37	8

D912

Case 2 Procedure (Level in Somerset Dam is above EL 100.45)

The sluices gates are to be operated in accordance with the following graph:



Sluices are progressively closed at one hour intervals if operating above the Operating Target Line and progressively opened at one hour intervals if operating below the Operating Target Line. The aim is always to follow the Operating Target Line as closely as possible.

10.4 Equipment Failure

In the event of equipment failure the action to be taken is indicated in Appendix E for Wivenhoe Dam and Appendix F for Somerset Dam.

D913

APPENDIX A
AGENCIES HOLDING CONTROLLED COPIES OF THIS MANUAL

Agency	Responsible Person	Location
Seqwater	Dam Safety and Source Operations Manager	Brisbane
Seqwater	Principal Engineer Dam Safety	Ipswich
Seqwater	Storage Supervisor	Wivenhoe Dam
Seqwater	Storage Supervisor	Somerset Dam
Seqwater	Operations Coordinator	Central
Seqwater	Senior Flood Operations Engineer	Flood Operations Centre, Brisbane
Department of Environment and Natural Resources	Director Dam Safety	Brisbane
Department of Emergency Services	Duty Officer – Disaster Management Service	Brisbane
Somerset Regional Council	Local Disaster Response Coordinator	Esk
Ipswich City Council	Local Disaster Response Coordinator	Ipswich
Brisbane City Council	Local Disaster Response Coordinator	Brisbane
Emergency Management Queensland	Regional Director, Brisbane District	Brisbane

D914

APPENDIX B
KEY REFERENCE GAUGES

Location	Gauge Zero	1974 Gauge Height	Minor Flood		Moderate Flood		Major Flood	
			Gauge Height	Flow	Gauge Height	Flow	Gauge Height	Flow
	m AHD	m	m	m^3/s	m	m^3/s	m	m^3/s
Stanley River at Somerset Dam	0.00	106.57	103.0		105.0		106.0	
Brisbane River at Lowood	23.68	22.02	8.0	1,000	15.0	3,300	20.0	6,000
Brisbane River at Lowood	22.74	-	8.6		15.9		21.2	
Brisbane River at Savages Crossing	18.43	23.79	9.0		16.0		21.0	
Brisbane River at Mt Crosby	0.00	26.74	11.0		13.0		21.0	
Bremer River at Ipswich	0.00	20.70	7.0		9.0		11.7	
Brisbane River at Moggill	0.00	19.95	10.0	4,000	13.0	5,000	15.5	6,500
Brisbane River at Jindalee Bridge	0.00	14.10	6.0		8.0		10.0	
Brisbane River at City Gauge	0.00	5.45	1.7		2.6		3.5	

Flows are approximate only and gauge heights are tide dependent in the lower reaches.

D915

APPENDIX C
WIVENHOE DAM TECHNICAL DATA

STORAGE AND UNCONTROLLED GATE DISCHARGES						
Storage Level	**Storage Capacity**	**Flood Capacity (3)**	**Net Inflow per 1mm rise per hour (2)**	**Discharge per Regulator (1)**	**Discharge per Spillway Bay (1)**	**Maximum Available Discharge**
m AHD	$x10^3$ ML	10^6 m^3	m^3/s	m^3/s	m^3/s	m^3/s
57.0	414	-	11.1	24.9	0	50
57.5	453	-	12.0	25.2	4	69
58.0	466	-	13.0	25.4	15	128
58.5	494	-	13.9	25.7	32	211
59.0	523	-	14.8	25.9	53	316
59.5	553	-	15.8	26.2	77	439
60.0	584	-	16.7	26.4	105	579
60.5	616	-	17.6	26.6	136	735
61.0	649	-	18.6	26.9	170	905
61.5	683	-	19.5	27.1	207	1,090
62.0	719	-	20.5	27.3	246	1,290
62.5	756	-	21.3	27.5	288	1,495
63.0	795	-	22.3	27.8	333	1,720
63.5	835	-	23.3	28.0	379	1,950
64.0	877	-	24.2	28.2	428	2,195
64.5	920	-	25.1	28.4	479	2,450
65.0	965	-	26.1	28.7	532	2,720
65.5	1,012	-	27.0	28.9	587	2,995
66.0	1,061	-	27.9	29.1	645	3,280
66.5	1,112	-	28.9	29.3	704	3,580
67.0	1,165	0	29.8	29.5	765	3,885
67.5	1,220	56	30.7	29.7	828	4,200
68.0	1,276	112	31.7	29.9	893	4,525
68.5	1,334	171	32.6	30.1	959	4,860
69.0	1,393	230	33.5	30.3	1,028	5,200

D916

Storage Level	Storage Capacity	Flood Capacity (3)	Net Inflow per 1mm rise per hour (2)	Discharge per Regulator (1)	Discharge per Spillway Bay (1)	Maximum Available Discharge
m AHD	$x10^3$ ML	10^6 m^3	m^3/s	m^3/s	m^3/s	m^3/s
69.5	1,454	290	34.5	30.5	1,098	5,550
70.0	1,517	350	35.4	30.7	1,170	5,910
70.5	1,581	418	36.3	30.9	1,244	6,280
71.0	1,647	485	37.3	31.1	1,319	6,660
71.5	1,714	550	38.2	31.3	1,396	7,040
72.0	1,783	615	39.1	31.5	1,474	7,430
72.5	1,854	683	40.1	31.7	1,554	7,840
73.0	1,926	750	41.0	31.9	1,636	8,240
73.5	2,000	830	41.9	32.1	1,719	8,660
74.0	2,076	910	42.9	32.3	1,804	9,080
74.5	2,153	995	43.8	32.5	1,890	9,520
75.0	2,232	1,080	44.7	32.7	1,978	9,960
75.5	2,313	1,160	45.7	32.9	2,067	10,400
76.0 (4)	2,395	1,240	46.6	33.1	2,158	10,860
76.5	2,480	1,258	47.6	33.3	2,250	11,320
77.0	2,566	1,420	48.5	33.4	2,343	11,780
77.5	2,655	1,500	49.4	36.6	2,438	12,260
78.0	2,746	1,580	50.4	33.8	2,535	12,740
78.5	2,839	1,680	51.3	34.0	2,632	13,230
79.0	2,934	1,780	52.2	34.2	2,700	13,500
79.5	3,032	1,880	54.4	34.4	2,700	13,500
80.0	3,132	1,980	55.6	34.6	2,700	13,500

(1) This is the maximum discharge of an individual spillway bay or regulator. Total discharge is calculated by adding the contributions of each gate or regulator. There are two (2) regulators to five (5) spillway bays.

(2) This assumes that all gates and sluices are closed. Discharges through the spillway have to be added to the above figures to calculate the actual inflow into the reservoir.

(3) The temporary storage above normal Full Supply Level of EL 67.0.

(4) The first fuse plug is designed to trigger at EL75.7. Above this level, fuse plug flows from Table E.3 need to be added to give the full outflow.

D917

INDIVIDUAL RADIAL GATE - RATING TABLE (Outflows in m3/s – Gate Openings in metres open)

Water EL (m AHD)	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0
67.0	0	49	98	146	194	240	285	329	372	413	453	492	530	567	603	639	675	709	744	765															
67.2	0	49	99	148	196	243	288	333	376	418	458	498	537	574	611	648	684	720	755	790															
67.4	0	50	100	149	198	245	291	336	380	422	464	504	543	582	619	657	693	730	766	802	815														
67.6	0	50	101	151	200	248	294	340	384	427	469	510	550	589	627	665	702	740	777	814	841														
67.8	0	51	102	152	202	250	297	343	388	432	474	515	556	596	635	673	712	750	787	825	863	867													
68.0	0	51	103	154	204	253	300	347	392	436	479	521	562	603	642	682	721	759	798	837	876	893													
68.2	0	52	104	155	206	255	303	350	396	441	484	527	569	610	650	690	729	769	808	848	888	919													
68.4	0	52	105	156	207	257	306	354	400	445	489	532	575	616	657	698	738	778	818	859	899	940	946												
68.6	0	53	105	158	209	260	309	357	404	450	494	538	581	623	665	706	747	788	829	870	911	953	973												
68.8	0	53	106	159	211	262	312	360	408	454	499	543	587	630	672	714	755	797	838	880	923	965	1000												
69.0	0	54	107	160	213	264	315	364	412	458	504	549	593	636	679	722	764	806	848	891	934	977	1022	1028											
69.2	0	54	108	162	215	267	317	367	415	463	509	554	599	643	686	729	772	815	858	901	945	989	1035	1056											
69.4	0	54	109	163	217	269	320	370	419	467	514	560	605	649	693	737	780	824	868	912	956	1001	1047	1084											
69.6	0	55	110	164	218	271	323	373	423	471	518	565	611	656	700	744	789	833	877	922	967	1013	1060	1107	1112										
69.8	0	55	111	166	220	273	326	377	427	475	523	570	616	662	707	752	797	842	887	932	978	1025	1072	1121	1141										
70.0	0	56	112	167	222	276	328	380	430	479	528	575	622	668	714	759	805	850	896	942	989	1036	1085	1134	1170										
70.2	0	56	112	168	224	278	331	383	434	484	532	580	628	674	721	767	813	859	905	952	1000	1048	1097	1147	1198	1199									
70.4	0	56	113	170	225	280	334	386	437	488	537	586	633	680	727	774	821	867	914	962	1010	1059	1109	1160	1212	1229									
70.6	0	57	114	171	227	282	336	389	441	492	542	591	639	687	734	781	828	876	923	972	1020	1070	1121	1173	1226	1258									
70.8	0	57	115	172	229	284	339	392	445	496	546	596	644	693	741	788	836	884	932	981	1031	1081	1133	1185	1239	1289									
71.0	0	58	116	173	230	286	341	395	448	500	551	601	650	699	747	795	844	892	941	991	1041	1092	1144	1198	1252	1309	1319								
71.2	0	58	117	175	232	289	344	398	452	504	555	605	655	705	754	802	851	900	950	1000	1051	1103	1156	1210	1266	1323	1349								
71.4	0	58	117	176	234	291	347	401	455	508	559	610	661	710	760	809	859	908	959	1009	1061	1114	1167	1222	1279	1337	1380								
71.6	0	59	118	177	235	293	349	404	458	512	564	615	666	716	766	816	866	916	967	1019	1071	1124	1179	1234	1292	1350	1410	1411							
71.8	0	59	119	178	237	295	352	407	462	515	568	620	671	722	773	823	874	924	976	1028	1081	1135	1190	1246	1304	1364	1425	1443							
72.0	0	60	120	180	239	297	354	410	465	519	572	625	676	728	779	830	881	932	984	1037	1091	1145	1201	1258	1317	1377	1439	1474							
72.2	0	60	121	181	240	299	357	413	469	523	577	629	682	733	785	837	888	940	993	1046	1100	1156	1212	1270	1330	1391	1454	1506							
72.4	0	60	121	182	242	301	359	416	472	527	581	634	687	739	791	843	895	948	1001	1055	1110	1166	1223	1282	1342	1404	1468	1533	1538						
72.6	0	61	122	183	243	303	361	419	475	531	585	639	692	745	797	850	903	956	1009	1064	1119	1176	1234	1293	1354	1417	1482	1548	1570						
71.8	0	61	123	184	245	305	364	422	478	534	589	643	697	750	803	856	910	963	1018	1073	1129	1186	1245	1305	1367	1430	1496	1563	1603						
73.0	0	62	124	185	247	307	366	425	482	538	593	648	702	756	809	863	917	971	1026	1081	1138	1196	1255	1316	1379	1443	1509	1577	1636						
73.2	2	62	124	187	248	309	369	427	485	542	597	653	707	761	815	869	924	978	1034	1090	1147	1206	1266	1327	1391	1456	1523	1592	1663	1669					
73.4	6	62	125	188	250	311	371	430	488	545	602	657	712	767	821	876	931	986	1042	1099	1156	1216	1276	1339	1403	1469	1536	1606	1678	1702					
73.6	11	64	126	189	251	313	373	433	491	549	606	662	717	772	827	882	937	993	1050	1107	1166	1225	1287	1350	1414	1481	1550	1620	1693	1736					
73.8	17	69	127	190	253	315	376	436	495	553	610	666	722	778	833	888	944	1001	1058	1116	1175	1235	1297	1361	1426	1494	1563	1635	1708	1770					

UNCONTROLLED DISCHARGE TO THE RIGHT OF THE RED LINE

GATE OVERTOPPED IN SHADED AREA

INDIVIDUAL RADIAL GATE - RATING TABLE (Outflows in m3/s – Gate Openings in metres open)

Water EL (m AHD)	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5
74.0	23	74	129	191	254	317	378	438	498	556	614	671	727	783	839	895	951	1008	1065	1124	1184	1245	1307	1372	1438	1506	1576	1648	1723	1800	1804					
74.2	31	80	133	192	256	319	380	441	501	560	618	675	732	788	845	901	958	1015	1073	1132	1192	1254	1317	1382	1449	1518	1589	1662	1738	1815	1838					
74.4	39	87	139	195	257	321	383	444	504	563	622	679	737	793	850	907	964	1022	1081	1140	1201	1264	1327	1393	1461	1530	1602	1676	1752	1831	1873	UNCONTROLLED DISCHARGE				
74.6	47	94	145	200	259	322	385	447	507	567	626	684	741	799	856	913	971	1029	1089	1149	1210	1273	1337	1404	1472	1542	1615	1690	1767	1846	1908	TO THE RIGHT OF THE RED LINE				
74.8	56	103	153	206	262	324	387	449	510	570	629	688	746	804	862	919	978	1036	1096	1157	1219	1282	1347	1414	1483	1554	1628	1703	1781	1861	1943					
75.0	66	112	161	213	267	326	390	452	513	574	633	692	751	809	867	926	984	1044	1104	1165	1227	1291	1357	1425	1494	1566	1640	1717	1795	1876	1960	1978				
75.2	76	121	169	220	274	330	392	455	516	577	637	697	756	814	873	932	991	1051	1111	1173	1236	1301	1367	1435	1506	1578	1653	1730	1809	1891	1976	2013				
75.4	87	131	178	229	281	336	394	457	519	581	641	701	760	819	878	938	997	1057	1119	1181	1245	1310	1377	1446	1517	1590	1665	1743	1823	1906	1992	2049				
75.6	98	141	188	237	289	343	399	460	522	584	645	705	765	824	884	944	1004	1064	1126	1189	1253	1319	1386	1456	1527	1601	1678	1756	1837	1921	2007	2085				
75.8	109	152	198	247	298	350	405	463	525	587	649	709	769	829	889	949	1010	1071	1133	1197	1261	1328	1396	1460	1538	1613	1690	1769	1851	1936	2023	2112	2121			
76.0	121	164	209	257	307	359	412	468	528	591	652	713	774	834	895	955	1016	1078	1141	1205	1270	1337	1405	1476	1549	1624	1702	1782	1865	1950	2038	2129	2158			
76.2	133	175	220	268	317	368	421	475	532	594	656	718	779	839	900	961	1023	1085	1148	1212	1278	1346	1415	1486	1560	1636	1714	1795	1878	1965	2053	2145	2194			
76.4	146	187	232	279	327	378	429	483	539	597	660	722	783	844	906	967	1029	1092	1155	1220	1286	1354	1424	1496	1570	1647	1726	1808	1892	1979	2069	2161	2231			
76.6	159	200	244	290	338	388	439	492	546	603	664	726	788	849	911	973	1035	1098	1162	1228	1295	1363	1434	1506	1581	1658	1738	1820	1905	1993	2084	2177	2268			
76.8	173	213	257	302	350	399	449	501	554	610	668	730	792	854	916	978	1041	1105	1170	1235	1303	1372	1443	1516	1591	1669	1750	1833	1919	2007	2099	2193	2289	2306		
77.0	186	226	270	315	362	410	460	511	564	618	674	734	797	859	921	984	1047	1112	1177	1243	1311	1380	1452	1526	1602	1680	1762	1845	1932	2021	2113	2208	2306	2343		
77.2	200	240	283	328	374	422	471	522	574	627	682	739	801	864	927	990	1054	1118	1184	1250	1319	1389	1461	1536	1612	1691	1773	1858	1945	2035	2128	2224	2322	2381		
77.4	215	254	297	341	387	435	483	533	584	637	691	747	806	869	932	996	1060	1125	1191	1258	1327	1398	1470	1545	1622	1702	1785	1870	1958	2049	2143	2239	2339	2419		
77.6	230	269	311	355	400	447	496	545	595	647	700	756	813	873	937	1001	1066	1131	1198	1265	1335	1406	1479	1555	1633	1713	1796	1882	1971	2063	2157	2255	2355	2457		
77.8	245	283	325	369	414	461	508	557	607	658	711	765	821	880	942	1007	1072	1138	1205	1273	1343	1414	1488	1564	1643	1724	1808	1894	1984	2076	2172	2270	2371	2475	2496	
	GATE OVERTOPPED IN SHADED AREA																																			
78.0	260	299	340	383	428	474	522	570	619	670	722	775	831	888	948	1012	1078	1144	1211	1280	1351	1423	1497	1574	1653	1735	1819	1907	1997	2090	2186	2285	2387	2492	2535	
78.2	276	314	355	398	442	488	535	583	632	682	733	786	840	896	954	1016	1084	1150	1218	1288	1358	1431	1506	1583	1663	1745	1831	1919	2010	2104	2200	2300	2403	2509	2573	
78.4	291	329	369	412	456	501	548	595	644	693	744	796	850	905	960	1023	1090	1157	1225	1295	1366	1440	1515	1593	1673	1756	1842	1931	2022	2117	2215	2316	2419	2526	2612	
78.6	307	344	384	426	470	515	561	608	656	705	755	807	859	913	965	1029	1096	1163	1232	1302	1374	1448	1524	1602	1683	1767	1853	1943	2035	2131	2229	2331	2435	2543	2651	
78.8	322	359	399	441	484	529	574	621	668	717	766	817	869	921	971	1034	1102	1170	1239	1310	1382	1456	1533	1612	1693	1778	1865	1955	2048	2144	2244	2346	2451	2560	2689	
79.0	338	374	414	455	498	542	588	634	681	729	778	827	878	929	977	1040	1108	1176	1246	1317	1390	1465	1542	1621	1703	1788	1876	1967	2061	2158	2258	2361	2467	2577	2700	
79.2	353	389	428	470	512	556	601	646	693	740	789	838	888	938	983	1046	1114	1183	1253	1324	1398	1473	1551	1631	1714	1799	1887	1979	2074	2171	2272	2376	2483	2594	2700*	
79.4	368	404	443	484	526	570	614	659	705	752	800	848	897	946	988	1051	1120	1189	1260	1332	1406	1481	1560	1640	1724	1810	1899	1991	2086	2185	2287	2391	2499	2610	2700*	
79.6	384	419	458	498	540	583	627	672	717	764	811	859	907	954	994	1057	1126	1195	1266	1339	1413	1490	1569	1650	1734	1820	1910	2003	2099	2198	2301	2407	2516	2627	2700*	
79.8	399	435	473	513	554	597	640	685	730	775	822	869	916	963	1000	1062	1132	1202	1273	1346	1421	1498	1578	1659	1744	1831	1922	2015	2112	2212	2315	2422	2532	2644	2700*	
80.0	415	450	487	527	568	610	654	697	742	787	833	879	926	971	1006	1068	1137	1208	1280	1354	1429	1507	1586	1669	1754	1842	1933	2027	2125	2226	2330	2437	2548	2661	2700*	

* Flow impacted by bridge deck.

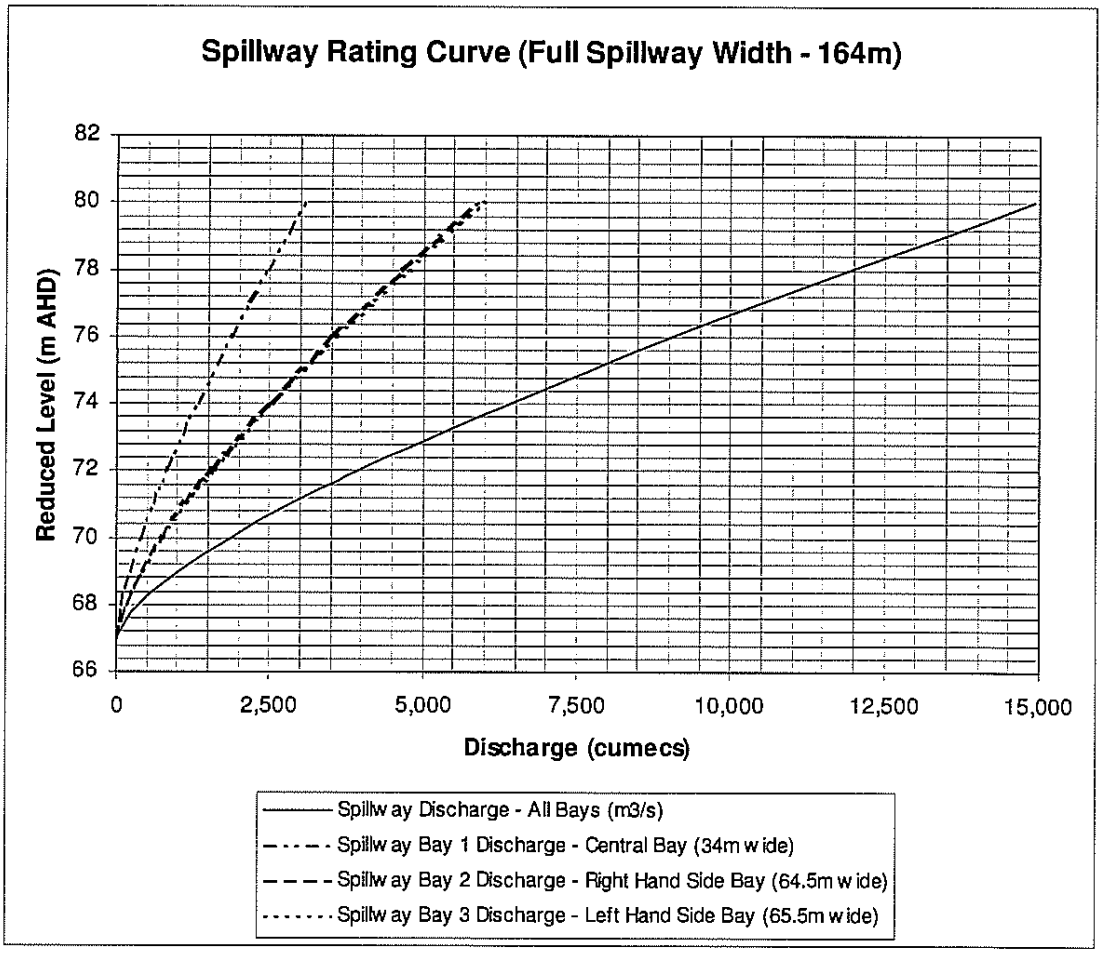
WIVENHOE DAM RADIAL GATES
TOP AND BOTTOM GATE LEVELS FOR VARIOUS GATE OPENINGS

GATE OPENING (m)	BOTTOM OF GATE (m AHD)	TOP OF GATE (m AHD)	GATE OPENING (m)	BOTTOM OF GATE (m AHD)	TOP OF GATE (m AHD)
0.0	56.36	73.00	8.6	64.57	78.70
0.2	56.53	73.17	8.8	64.77	78.79
0.4	56.70	73.34	9.0	64.97	78.88
0.6	56.88	73.50	9.2	65.17	78.96
0.8	57.06	73.67	9.4	65.37	79.04
1.0	57.24	73.83	9.6	65.57	79.12
1.2	57.42	73.99	9.8	65.77	79.20
1.4	57.60	74.15	10.0	65.97	79.28
1.6	57.78	74.31	10.2	66.17	79.35
1.8	57.96	74.46	10.4	66.37	79.42
2.0	58.14	74.62	10.6	66.57	79.49
2.2	58.33	74.77	10.8	66.76	79.55
2.4	58.51	74.92	11.0	66.96	79.62
2.6	58.70	75.07	11.2	67.16	79.68
2.8	58.89	75.22	11.4	67.36	79.74
3.0	59.08	75.37	11.6	67.55	79.79
3.2	59.27	75.51	11.8	67.75	79.85
3.4	59.46	75.66	12.0	67.94	79.90
3.6	59.65	75.80	12.2	68.14	79.95
3.8	59.84	75.94	12.4	68.33	80.00
4.0	60.03	76.07	12.6	68.53	80.04
4.2	60.22	76.21	12.8	68.72	80.08
4.4	60.42	76.34	13.0	68.91	80.12
4.6	60.61	76.48	13.2	69.10	80.16
4.8	60.80	76.61	13.4	69.29	80.19
5.0	61.00	76.74	13.6	69.48	80.22
5.2	61.19	76.86	13.8	69.67	80.25
5.4	61.39	76.99	14.0	69.86	80.28
5.6	61.59	77.11	14.2	70.05	80.31
5.8	61.78	77.23	14.4	70.24	80.33
6.0	61.98	77.35	14.6	70.42	80.35
6.2	62.18	77.47	14.8	70.61	80.36
6.4	62.38	77.58	15.0	70.79	80.38
6.6	62.58	77.69	15.2	70.97	80.39
6.8	62.78	77.80	15.4	71.15	80.40
7.0	62.97	77.91	15.6	71.34	80.41
7.2	63.17	78.02	15.8	71.52	80.41
7.4	63.37	78.12	16.0	71.69	80.41
7.6	63.57	78.22	16.2	71.87	80.41
7.8	63.77	78.32	16.4	72.05	80.41
8.0	63.97	78.42	16.6	72.22	80.41
8.2	64.17	78.52	16.8	72.40	80.40
8.4	64.37	78.61	17.0	72.57	80.39
8.6	64.57	78.70	17.2	72.74	80.38
8.8	64.77	78.79	17.4	72.91	80.36
9.0	64.97	78.88	17.5	73.00	80.35

D920

WIVENHOE DAM AUXILIARY SPILLWAY RATING TABLE

Storage Level	Spillway Discharge			
	Central Bay (34m wide)	Right Side Bay (64.5m wide)	Left Side Bay (65.5m wide)	All Bays
m AHD	m^3/s	m^3/s	m^3/s	m^3/s
67	0	0	0	0
68	75	142	144	361
69	212	401	408	1,020
70	385	731	742	1,858
71	590	1,120	1,137	2,847
72	821	1,558	1,582	3,961
74	1,329	2,521	2,560	6,409
76	1,873	3,553	3,608	9,033
78	2,468	4,683	4,755	11,907
80	3,092	5,865	5,956	14,913



D921

APPENDIX D
SOMERSET DAM TECHNICAL DATA

STORAGE AND DISCHARGE CHARACTERISTICS							
Storage Level	**Reservoir Capacity**	**Temporary Flood Storage**	**Inflow to produce 1mm rise per hour**	**Discharge per Regulator**	**Discharge per Sluice**	**Discharge per Spillway Bay**	**Maximum Available Discharge**
m AHD	$x10^3$ ML	10^6 m^3	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s
90.0	120.3	-	5.3	57	163	-	1,529
90.5	129.5	-	5.5	58	165	-	1,550
91.0	139.3	-	4.9	58	167	-	1,572
91.5	149.6	-	5.3	59	170	-	1,593
92.0	160.5	-	5.7	60	172	-	1,614
92.5	172.0	-	6.1	60	174	-	1,635
93.0	184.1	-	6.8	61	176	-	1,655
93.5	196.7	-	7.1	62	179	-	1,676
94.0	210.0	-	7.4	62	181	-	1,695
94.5	224.0	-	7.8	63	183	-	1,715
95.0	238.5	-	8.2	64	185	-	1,735
95.5	253.6	-	8.5	64	187	-	1,754
96.0	269.3	-	9.0	65	189	-	1,773
96.5	285.6	-	9.4	66	191	-	1,792
97.0	302.7	-	9.8	66	193	-	1,810
97.5	320.7	-	10.3	67	195	-	1,829
98.0	339.5	-	10.8	67	197	-	1,847
98.5	359.2	-	11.2	68	199	-	1,865
99.0	379.8	0	11.8	69	201	-	1,883
99.5	401.4	22	12.3	69	203	-	1,901
100.0	428.9	49	13.3	70	205	-	1,918
100.5	447.5	68	13.8	70	207	0	1,937
101.0	472.2	92	14.4	71	209	4	1,989
101.5	498.0	118	15.0	72	211	13	2,076
102.0	524.9	145	15.5	72	212	25	2,189
102.5	553.1	173	16.1	73	214	40	2,325
103.0	582.6	203	16.7	73	216	58	2,482
103.5	613.2	233	17.3	74	218	78	2,659
104.0	645.1	265	17.9	74	220	100	2,854
104.5	678.3	298	18.5	75	221	125	3,067
105.0	712.7	333	19.1	75	223	151	3,296

Storage Level	Reservoir Capacity	Temporary Flood Storage	Inflow to produce 1mm rise per hour	Discharge per Regulator	Discharge per Sluice	Discharge per Spillway Bay	Maximum Available Discharge
m AHD	$x10^3$ ML	10^6 m^3	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s
105.5	748.3	368	19.8	76	225	180	3,542
106.0	785.2	405	20.4	76	226	211	3,803
106.5	823.4	444	21.1	77	228	243	4,079
107.0	863.1	483	21.7	77	230	278	4,370
107.5	904.0	524	22.4	78	232	314	4,675
108.0	946.4	567	23.6	78	233	352	5,084
108.5	990.1	610	24.3	79	235	391	5,570
109.0	1035.3	656	23.1	79	236	433	6,111
109.5	1081.8	702	25.8	80	238	476	6,701
110.0	1129.8	750	26.7	80	240	520	7,334

The outlet works for Somerset Dam consist of:

- Four (4) cone dispersion type regulator values.
- Eight (8) sluice gates.
- Eight (8) radial crest gates.

The regulator values are drowned out when the dam tail water level (Wivenhoe headwater level) reaches EL 68.6 m AHD and the valves should generally not be used under these conditions. Discharge for each regulator valve may be computed using the following equation:

$$Q_{Regulator} = 12.714*(\text{Dam Headwater Elevation} - 70.20)^{0.5}$$

Discharge for each sluice gate may be computed using the following equation:

$$Q_{Sluice} = 40.022*(\text{Dam Headwater Elevation} - 73.15)^{0.4963}$$

The radial crest gates are normally kept open and come into operation whenever the headwater level exceeds EL 100.45. Discharge for each radial gate may be computed using the following equation:

$$Q_{Crest} = 12.137*(\text{Dam Headwater Elevation} - 100.45)^{1.6653}$$

At EL 107.45, flood waters commence to flow over the dam crest. To account for this discharge, the dam crest is assumed to operate as a broad crested weir with a spillway width of 135.33 m and a weir coefficient of 1.7. Discharge in these circumstances may be computed using the following equation:

$$Q_{Overflow} = 1.7*135.33*(\text{Dam Headwater Elevation} - 107.455)^{1.5}$$

D923

APPENDIX E
WIVENHOE DAM GATE OPERATION CONSIDERATIONS

SPILLWAY OPERATION PRINCIPLES

The radial gates are sequentially numbered from 1 to 5 from left to right looking in the downstream direction. Plans of the dam and spillway are contained in Appendix H.

The flip bucket spillway is designed to control the discharge from the reservoir and to dissipate the energy of the discharge. The flip throws the discharge clear of the concrete structures into a plunge pool where the energy is dissipated by turbulence. Under non-symmetric flow conditions, or when gates 1 and 5 are not operating, the discharge jet may impinge on the walls of the plunge pool, which has been excavated into erodible sandstone rock, and cause non-predictable erosion. Upstream migration of this erosion is to be avoided. The wing walls adjacent to the flip bucket deflect the discharge away from the walls of the plunge pool when gates 1 and 5 are operated.

Therefore in operating the spillway, the principles to be observed are, in order of priority:

(i) The discharge jet into the plunge pool is not to impinge on the right or left walls of the plunge pool.

(ii) The flow in the spillway is to be generally symmetrical.

The main purpose of gating the spillway is to exercise maximum possible control over the flow in the Brisbane River insofar as river flows in excess of 4,000 m^3/s cause damage to urban areas downstream. The gates also allow the routing of much larger floods with substantial flood mitigation being achieved.

RADIAL GATE OPERATION PRINCIPLES

Each radial gate consists of a cylindrical upstream skin-plate segment that is attached to the radial arms. The cylindrical axis is horizontal. Each gate rotates about two spherical trunnion bearings that are on this axis.

The position of the gate is controlled by hydraulically driven winches that are located on the piers beside the gates. Wire ropes are attached to the downstream face of the skin plate through a pulley system. The hydraulic motors work off a common pressure manifold and under perfectly matched conditions, will give an equal lifting force to each side of the gate. This system does not sense rope travel and will take up slack rope. It cannot prevent or correct skewing of the skin plate segment between the piers. If skewing occurs, skids will come into contact with the side seal plates to limit movement.

It is not possible to operate a winch independently of the other winch attached to the gate.

When the hydraulic motors are not energised, the gates are held in position by spring loaded friction brakes on the winches. There are two brake bands per winch and each band is capable of supporting half the weight of the gate. One winch can support the total weight of a gate on both its brake bands but not on one.

D924

While the radial gates have been designed to withstand overtopping, it should be avoided if possible. The reservoir levels and the structural state of the radial gates when in the closed position are as follows:

Reservoir Level m AHD	Radial Gate Stress Condition with Gate Closed
73	Normal
77	33% Overstress
79	Critical

Once overtopped, the gates become inoperable when the lifting tackle is fouled by debris from the overflow. The gates remain structurally secure until the reservoir level exceeds EL 77. The ability to control floods however may be lost.

FREE FALL OF THE RADIAL GATES

Under no circumstances are the radial gates allowed to free fall. The lower skin plate sections are overstressed if a freefall of 60 mm is arrested by the seal plate on the spillway.

If a gate becomes stuck in an open position, attempts are to be made to free the gate by applying positive lifting forces. Under no circumstances are the winches to be unloaded and the direct weight of the gates used to yield the obstruction.

OPERATION IN HIGH WIND

Other than in periods of mitigation of medium and major floods, the gates are not to be raised or lowered when clear of water, during periods of high winds. The gates can however, be held on the brakes in any position in the presence of high wind.

The term "high wind" means any wind that causes twisting or movement of the gate. While a precise figure cannot be placed on these velocities, further experience over time may allow a figure to be determined.

This limitation is required to prevent the gate from twisting from skew on one side to skew on the other side. While the gate is being raised or lowered, skewing cannot be prevented by the hydraulic lifting system and any impact forces encountered may damage the gate.

MAINTENANCE CONSIDERATIONS

No more than one gate is to be inoperable at any one time for maintenance. The maintenance is to be scheduled so that the spillway bay can be cleared of obstructions in a reasonable time to allow its use in the event of major flooding.

BULKHEAD GATE OPERATING LIMITATIONS

The bulkhead gate can be used to control discharge in an emergency situation where a radial gate is inoperable. It is transported to, and lowered upstream of the inoperable radial gate by means of the gantry crane. The following conditions apply:

(a) The bulkhead gate can always be lowered with any type of underflow; and

D925

(b) It is not possible to raise the bulkhead gate once it has been lowered past certain levels depending on upstream conditions without there being a pool of water between it and the radial gate.

It is thus possible to preserve storage by effectively closing the spillway even with one radial gate inoperable. It will not be possible to raise the bulkhead gate until the radial gate behind has been repaired and is again storing water between the bulkhead gate and itself.

The bulkhead gate is not to be used for flood regulation until the reservoir level is falling and not likely to rise within the period needed to repair the inoperable radial gate.

The spillway gantry crane is to be used to raise and lower the bulkhead gate. The crane operates at two speeds, 1.5 and 3.0 m/min. When within the bulkhead gate guides, the bulkhead gate is to be moved only at 1.5 m/min.

BULKHEAD GATE OVERTOPPING

In the event that the bulkhead gate is overtopped (reservoir level exceeds EL 69 when bulkhead gate is closed), it cannot be removed unless a pool of water fills the space between it and the radial gate behind. The closed bulkhead becomes critically stressed when the reservoir level overtops it to EL 71.4.

It is not possible to engage the lifting tackle while overtopping is occurring. While there is any risk that the bulkhead gate may be overtopped, the lifting gear is to be left engaged so that the gate can be raised once the downstream radial gate becomes operable.

BULKHEAD GATE DISCHARGE REGULATION

This procedure should only be used if the safety of the dam is at direct risk.

In the event that a radial gate is inoperable in a partially open position, the bulkhead gate can be used for flow regulation provided that the lower lip of the radial gate is clear of the underflow jet.

Where a pool exists between the bulkhead gate and a radial gate under flow conditions, the bulkhead gate will be subjected to additional pull-down and possibly subjected to vortex-induced vibrations. When this condition occurs, the bulkhead gate is to be lowered to dewater the pool. The bulkhead gate can then be adjusted to regulate the flow provided the underflow jet remains below the lower lip of the radial gate.

INOPERABLE RADIAL GATES

In the event of a major flood, where the full discharge capacity of the four operable radial gates is required, these gates are to be used to their full capacity to protect the embankment from overtopping. Under certain abnormal conditions, it may not be possible to operate one gate. The following guidelines are to be adopted.

(a) Gate 3 Inoperable

Gates 2 and 4 are to be used to regulate flood discharges, until the discharge impinges on the walls of the plunge pool. Gates 1 and 5 are then to be opened sufficiently to deflect the discharge into the plunge pool.

The bottoms of gates 1 and 5 are to be maintained at or below those of gates 2 and 4 respectively.

(b) Either Gate 2 or 4 Inoperable

Normal gate operating procedures are to be adopted, except that only the operable gate 2 or 4 is available for flood regulation beyond 500 m^3/s and not both.

(c) Either Gate 1 or 5 Inoperable

Normal gate operating procedures are to be adopted until the discharge impinges on the walls of the plunge pool. Thereafter the operable gate 1 or 5 is to be used in lieu of using the radial gate adjacent to the inoperable gate. The other radial gates are to be used in the normal way to control discharge.

EQUIPMENT MALFUNCTION

Normal gate operation is by means of two electric hydraulic pumps supplied by external mains supply electric power, with pump number 1 connected to gates 1 and 2 and the penstock gate, while pump number 2 is connected to gates 3, 4 and 5.

Normal gate operation may not be possible in the event of equipment malfunctions during the passing of a flood. The procedures to be followed under various possible events are outlined below.

Failure of External Electric Power

A diesel electric generator is used to provide a power supply. The generator supplies sufficient power to operate the gates normally.

Failure of One Electric Hydraulic Pump

In the event that one electric hydraulic pump fails, the connecting valves between pumps are to be switched such that both sets of hydraulic lines are connected to the operable pump, thus permitting operation of all 5 gates, one gate at a time.

Failure of Two Electric Hydraulic Pumps

In the event that both electric hydraulic pumps fail, either the mobile or fixed emergency diesel hydraulic pump is to be used to operate the gates, one gate at a time.

Rupture of Hydraulic Lines

Depending on location and severity, a hydraulic line rupture may cause a radial gate to become inoperable. Accordingly any ruptures to the hydraulic lines are to be repaired as soon as practical. Depending on the location of the rupture, it may be possible to use the mobile emergency diesel hydraulic pump to operate the impacted gate.

Contamination of Winch Brakes

Oil contamination of the winch brakes will reduce their holding capacity and possibly allow the gate to fall. The brake bands are to be inspected regularly and cleaned immediately if any contamination is observed.

Fouling of Radial Gate Lifting Tackle

D927

The lifting tackle consists of blocks, wire ropes and winch drums. If the gate is overtopped, debris may be collected on the wire ropes that may in turn foul the blocks or the winch drums. This may result in jamming of the wire rope or in uneven lifting, both of which may cause the gate to jam.

Fouling of Side Skids

The side skids have been designed to limit the side-sway and skew of the radial gates during operation. Under ideal conditions, the skids should not be in contact with the side seal plates.

If the winches are lifting the gates unevenly or in a skewed position, the lifting gear should be adjusted if possible.

D928

APPENDIX F
SOMERSET DAM AUXILIARY EQUIPMENT

DISCHARGE REGULATION

The normal operating procedure for Somerset Dam in the event of a flood requires the spillway gates to be raised to provide an uncontrolled spillway followed by opening of the low level outlets some time later. Plans of the dam and spillway are contained in Appendix I.

EMERGENCY POWER SUPPLY

In the event of a power failure at Somerset Dam, both a fixed and a mobile diesel generator are available to operate the regulators, sluice gates and radial gates. The fixed generator can also power the crane. A mobile auxiliary generator is also available for emergency operation of the regulators and gates.

FAILURE OF SPILLWAY GATES MACHINERY

If a spillway gate cannot be raised due to failure of the lifting machinery, the gantry crane may be attached to the gate and the gate can be raised using the gantry crane.

FAILURE OF SLUICE GATE MACHINERY

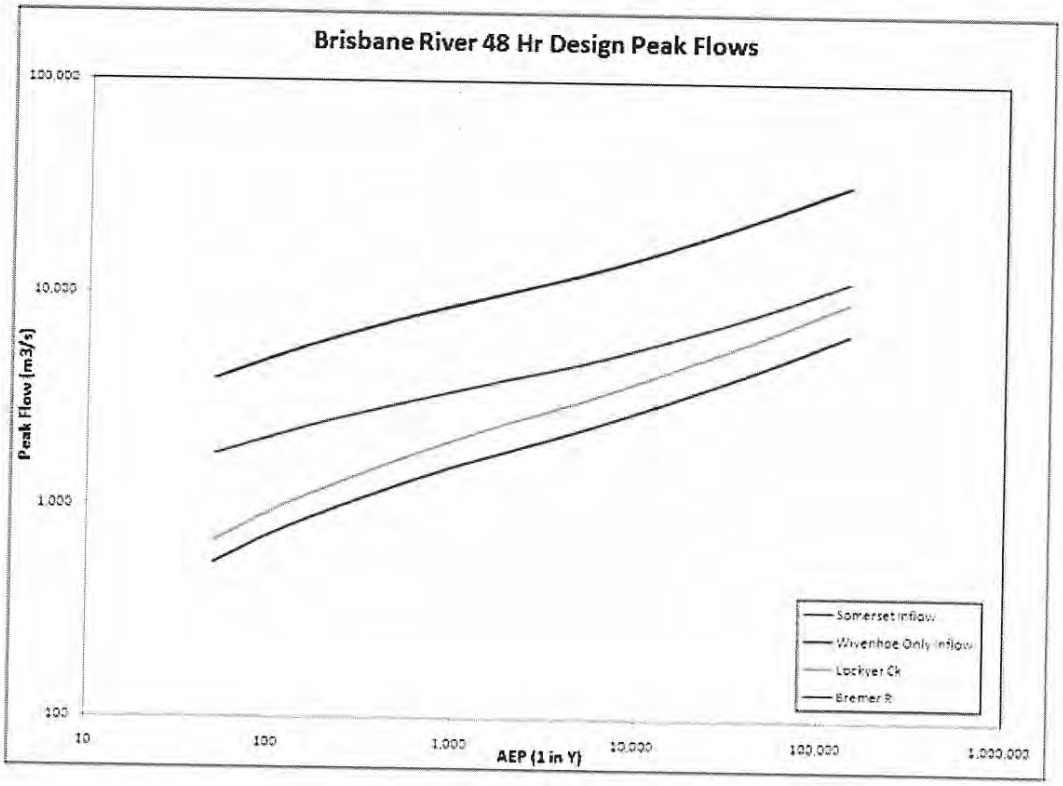
In the event of a sluice gate being jammed in the open position or the lifting machinery failing, the coaster gate at the dam can be lowered over the inlet to the sluice to preserve the water supply storage.

D929

APPENDIX G
HYDROLOGIC INVESTIGATIONS

The design hydrology for the Manual is based on the design hydrology undertaken in September 2005 in conjunction with the flood discharge capacity upgrade of Wivenhoe Dam. This work was undertaken by the Wivenhoe Alliance, the group responsible for undertaking the upgrade work. (Wivenhoe Alliance, Design Discharges and Downstream Impacts of the Wivenhoe Dam Upgrade Q1091, Sep 2005)

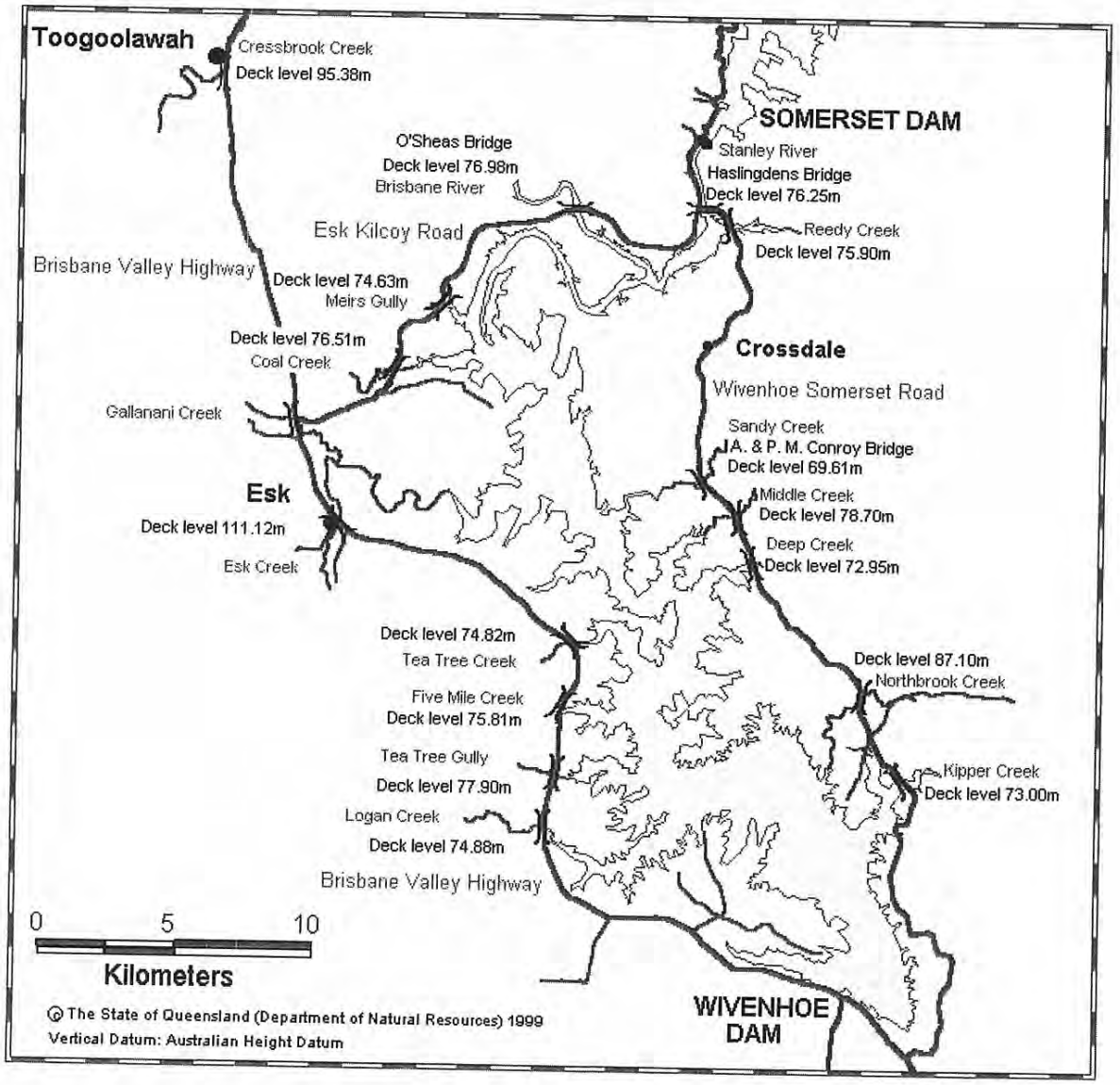
Floods in the Brisbane River catchment above Wivenhoe Dam can originate in either the Stanley River or upper Brisbane River catchment or both. Both of the dams are capable of being operated in a number of ways, each of which will reduce the flow downstream. Indicative inflows for the dams for 48 hour storm events (the critical duration for Wivenhoe Dam) are shown in the graph below. Full results containing inflows for a range of storm events and durations are contained in the Alliance reports.

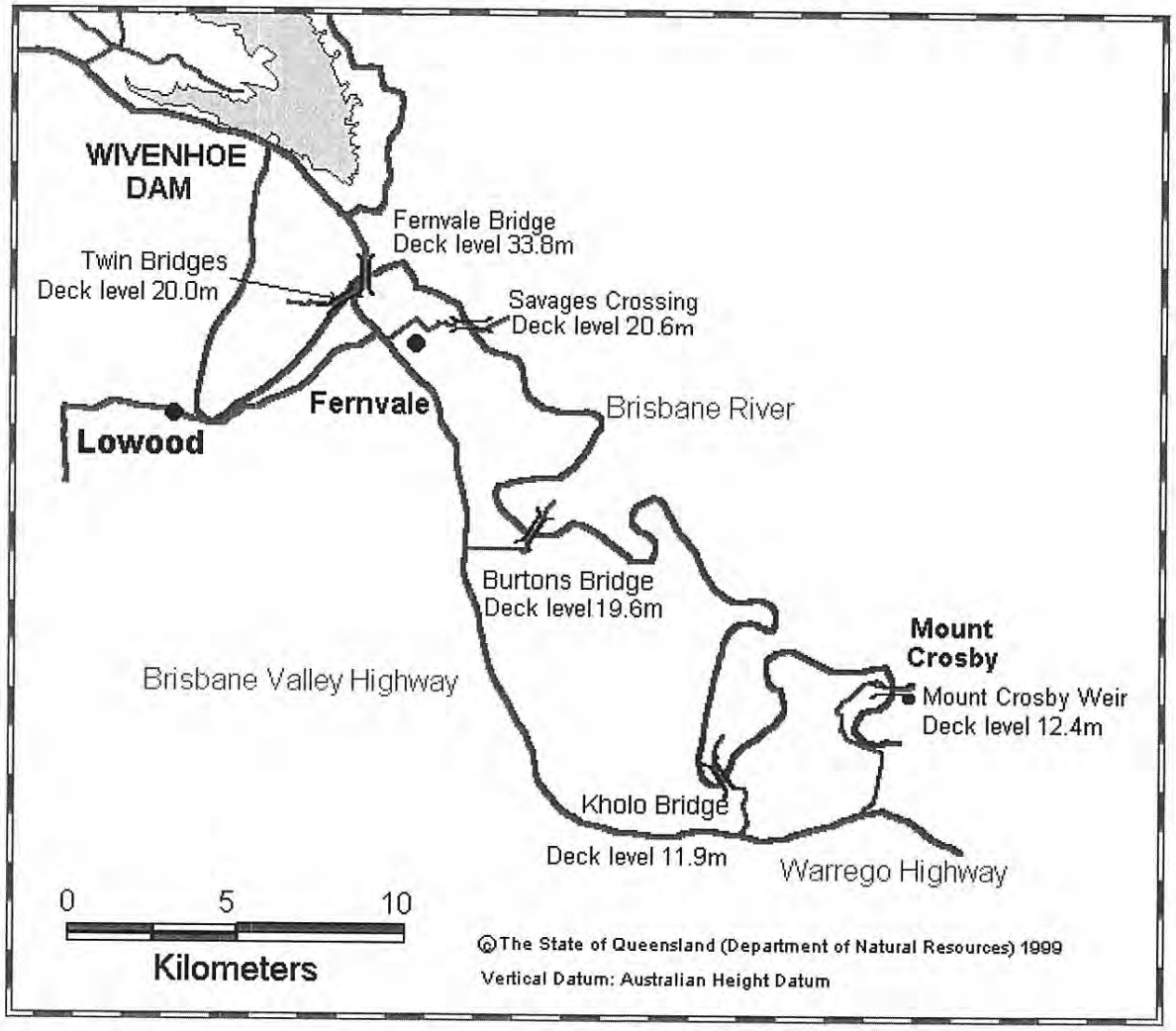


D930

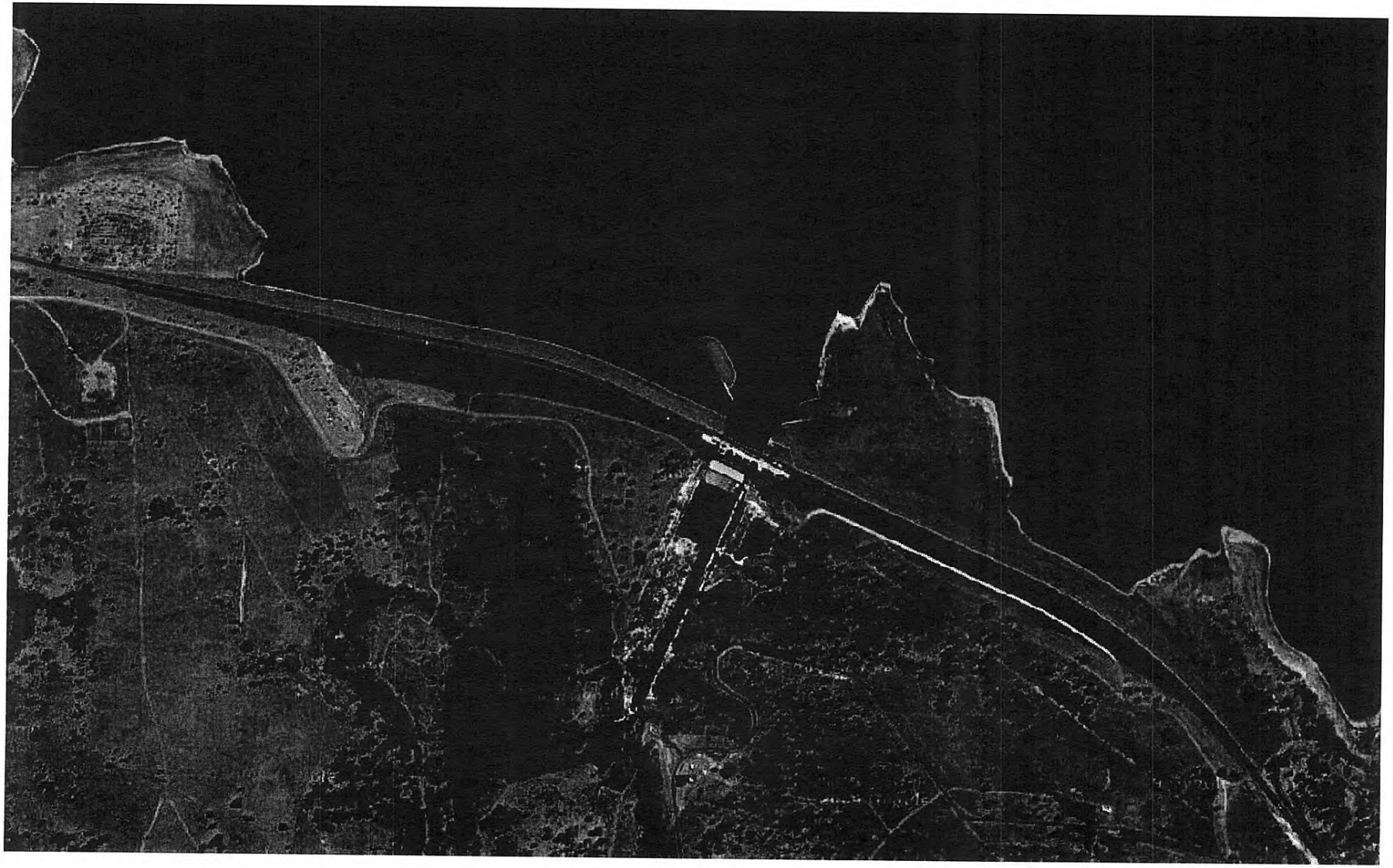
APPENDIX H
WIVENHOE DAM
PLANS, MAPS AND PHOTOGRAPHS

D931

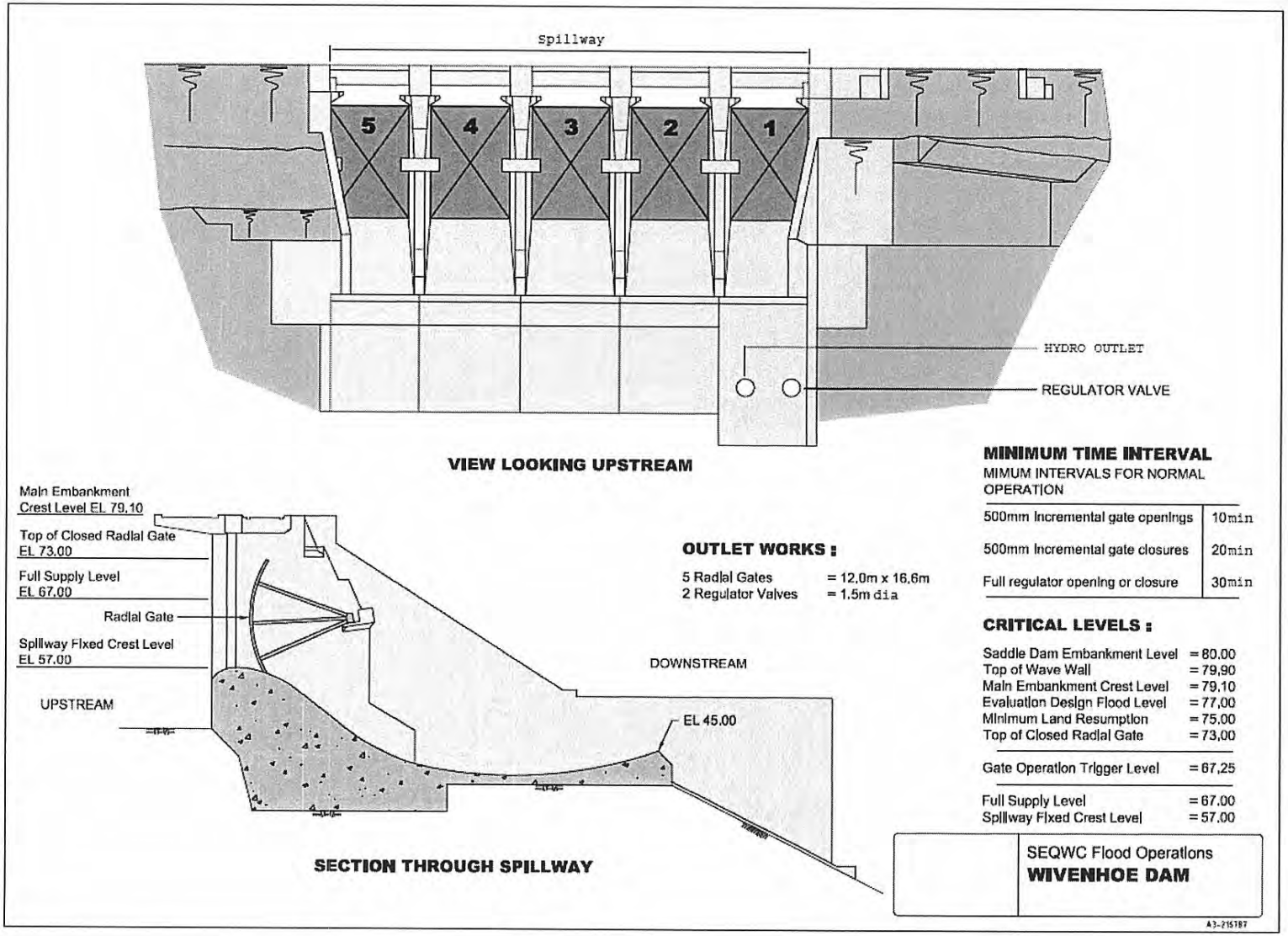

Toogoolawah
Cressbrook Creek
Deck level 95.38m
SOMERSET DAM
O'Sheas Bridge
Deck level 76.98m
Brisbane River
Stanley River
Haslingdens Bridge
Deck level 76.25m
Esk Kilcoy Road
Reedy Creek
Deck level 75.90m
Brisbane Valley Highway
Deck level 74.63m
Meirs Gully
Deck level 76.51m
Coal Creek
Crossdale
Wivenhoe Somerset Road
Gallanani Creek
Sandy Creek
J.A. & P. M. Conroy Bridge
Deck level 69.61m
Esk
Middle Creek
Deck level 78.70m
Deck level 111.12m
Deep Creek
Deck level 72.95m
Esk Creek
Deck level 74.82m
Tea Tree Creek
Deck level 87.10m
Northbrook Creek
Five Mile Creek
Deck level 75.81m
Tea Tree Gully
Deck level 77.90m
Kipper Creek
Deck level 73.00m
Logan Creek
Deck level 74.88m
Brisbane Valley Highway
0
5
10
Kilometers
© The State of Queensland (Department of Natural Resources) 1999
Vertical Datum: Australian Height Datum
WIVENHOE
DAM

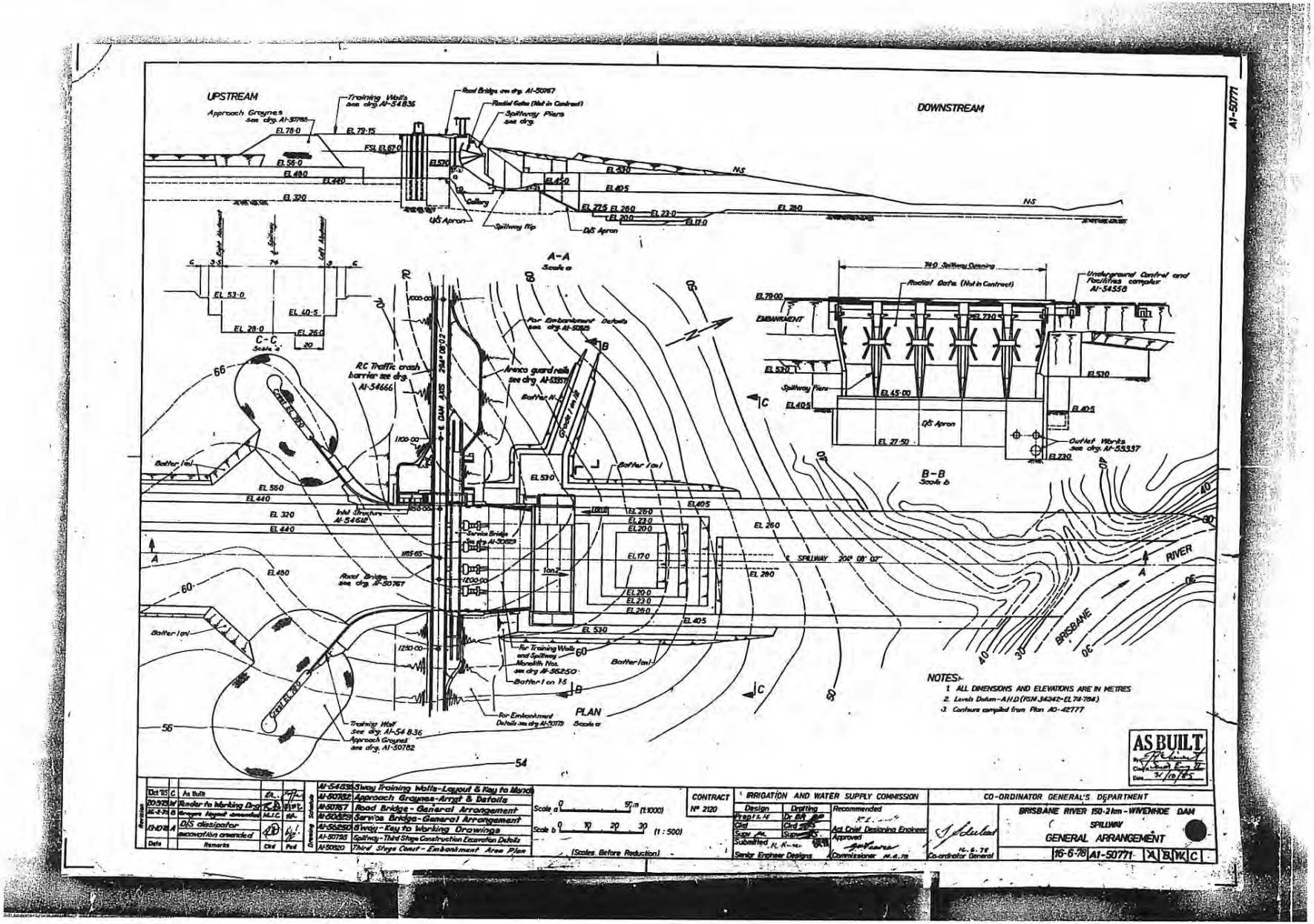

WIVENHOE
DAM
Fernvale Bridge
Deck level 33.8m
Twin Bridges
Deck level 20.0m
Savages Crossing
Deck level 20.6m
Fernvale
Lowood
Brisbane River
Burtons Bridge
Deck level 19.6m
Mount
Crosby
Mount Crosby Weir
Deck level 12.4m
Brisbane Valley Highway
Kholo Bridge
Deck level 11.9m
Warrego Highway
0
5
10
Kilometers
©The State of Queensland (Department of Natural Resources) 1999
Vertical Datum: Australian Height Datum

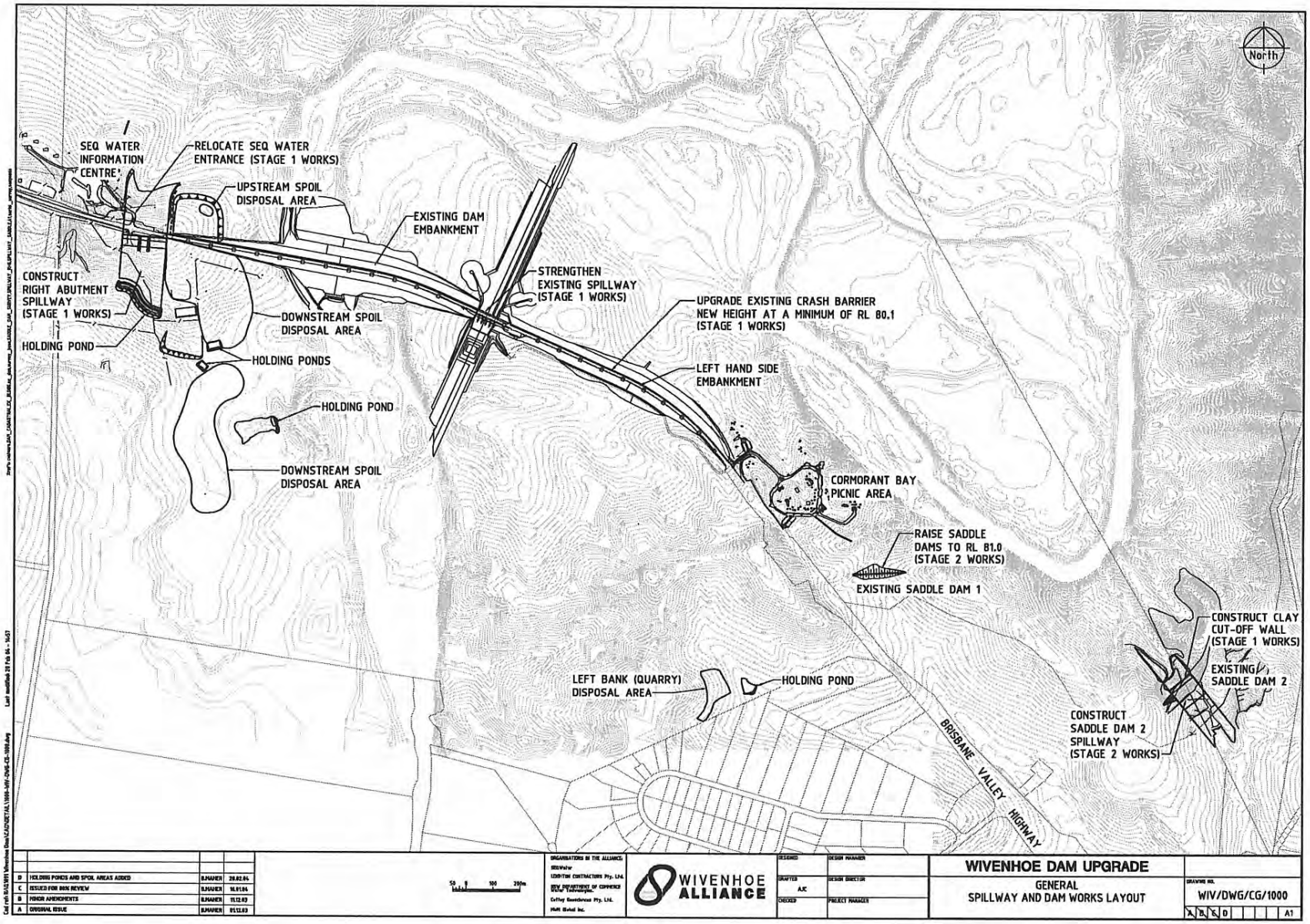
Wivenhoe Dam



D934


Spillway
5
4
3
2
1
HYDRO OUTLET
REGULATOR VALVE
VIEW LOOKING UPSTREAM
Main Embankment
Crest Level EL 79.10
Top of Closed Radial Gate
EL 73.00
Full Supply Level
EL 67.00
Radial Gate
Spillway Fixed Crest Level
EL 57.00
UPSTREAM
DOWNSTREAM
EL 45.00
SECTION THROUGH SPILLWAY
OUTLET WORKS :
5 Radial Gates = 12.0m x 16.6m
2 Regulator Valves = 1.5m dia
MINIMUM TIME INTERVAL
MIMUM INTERVALS FOR NORMAL OPERATION
500mm Incremental gate openings 10min
500mm Incremental gate closures 20min
Full regulator opening or closure 30min
CRITICAL LEVELS :
Saddle Dam Embankment Level = 80.00
Top of Wave Wall = 79.90
Main Embankment Crest Level = 79.10
Evaluation Design Flood Level = 77.00
Minimum Land Resumption = 75.00
Top of Closed Radial Gate = 73.00
Gate Operation Trigger Level = 67.25
Full Supply Level = 67.00
Spillway Fixed Crest Level = 57.00
SEQWC Flood Operations
WIVENHOE DAM
A3-215187

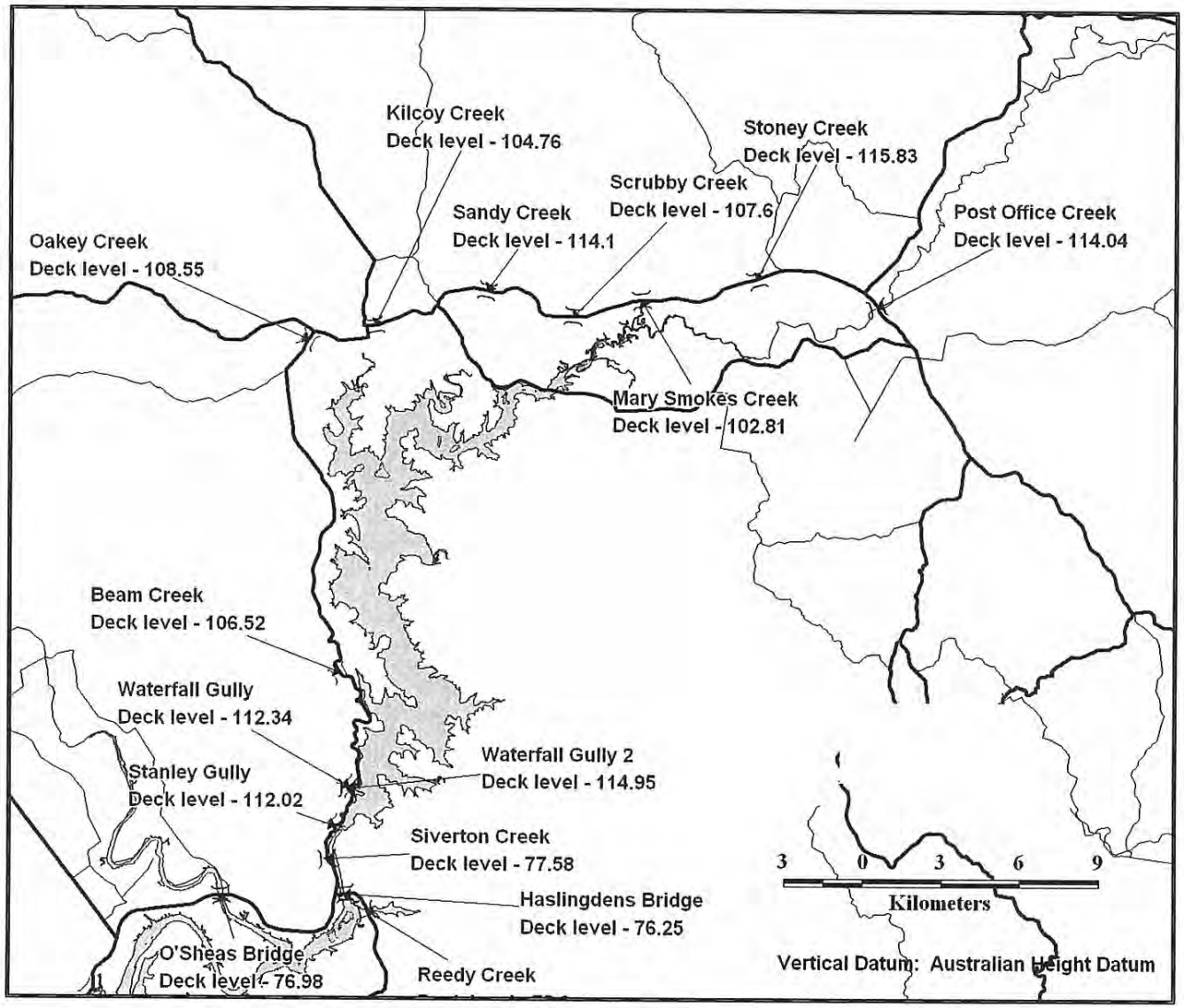

UPSTREAM
DOWNSTREAM
PLAN
A-A
B-B
C-C
NOTES:
1. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES
2. Levels Datum - A.H.D (PSM 34342 = EL 74·784)
3. Contours compiled from Plan A0-42777
AS BUILT
BRISBANE RIVER 150·2 km - WIVENHOE DAM
SPILLWAY
GENERAL ARRANGEMENT
16-6-78 A1-50771
IRRIGATION AND WATER SUPPLY COMMISSION
CO-ORDINATOR GENERAL'S DEPARTMENT
CONTRACT Nº 2120
A1-50771


North
SEQ WATER INFORMATION CENTRE
RELOCATE SEQ WATER ENTRANCE (STAGE 1 WORKS)
UPSTREAM SPOIL DISPOSAL AREA
EXISTING DAM EMBANKMENT
CONSTRUCT RIGHT ABUTMENT SPILLWAY (STAGE 1 WORKS)
HOLDING POND
DOWNSTREAM SPOIL DISPOSAL AREA
HOLDING PONDS
HOLDING POND
DOWNSTREAM SPOIL DISPOSAL AREA
STRENGTHEN EXISTING SPILLWAY (STAGE 1 WORKS)
UPGRADE EXISTING CRASH BARRIER NEW HEIGHT AT A MINIMUM OF RL 80.1 (STAGE 1 WORKS)
LEFT HAND SIDE EMBANKMENT
CORMORANT BAY PICNIC AREA
RAISE SADDLE DAMS TO RL 81.0 (STAGE 2 WORKS)
EXISTING SADDLE DAM 1
CONSTRUCT CLAY CUT-OFF WALL (STAGE 1 WORKS)
EXISTING SADDLE DAM 2
CONSTRUCT SADDLE DAM 2 SPILLWAY (STAGE 2 WORKS)
LEFT BANK (QUARRY) DISPOSAL AREA
HOLDING POND
BRISBANE VALLEY HIGHWAY
D HOLDING PONDS AND SPOIL AREAS ADDED
C ISSUED FOR BIN REVIEW
B MINOR AMENDMENTS
A ORIGINAL ISSUE
WIVENHOE ALLIANCE
WIVENHOE DAM UPGRADE
GENERAL
SPILLWAY AND DAM WORKS LAYOUT
WIV/DWG/CG/1000
A1

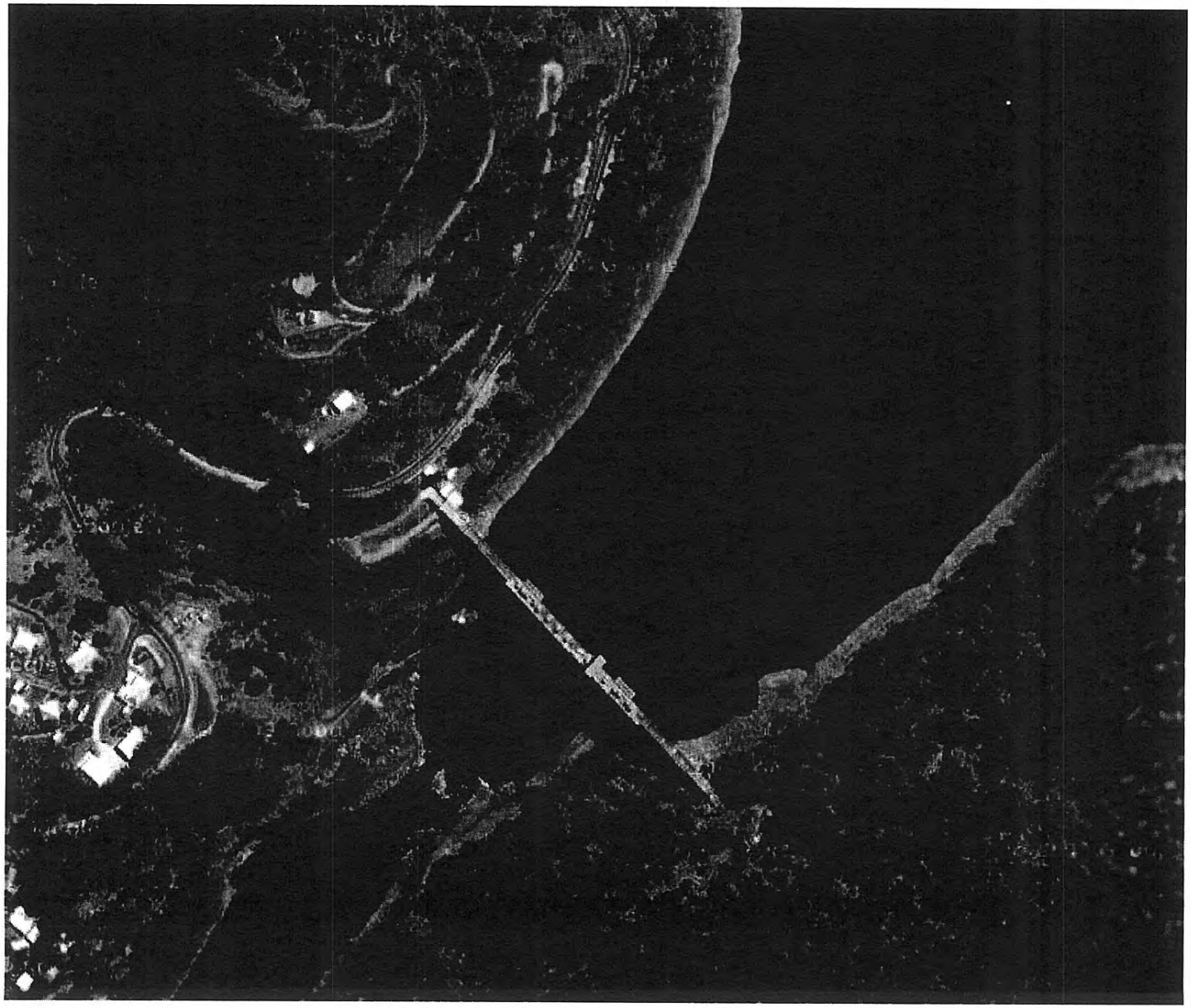
D937

APPENDIX I
SOMERSET DAM
PLANS, MAPS AND PHOTOGRAPHS

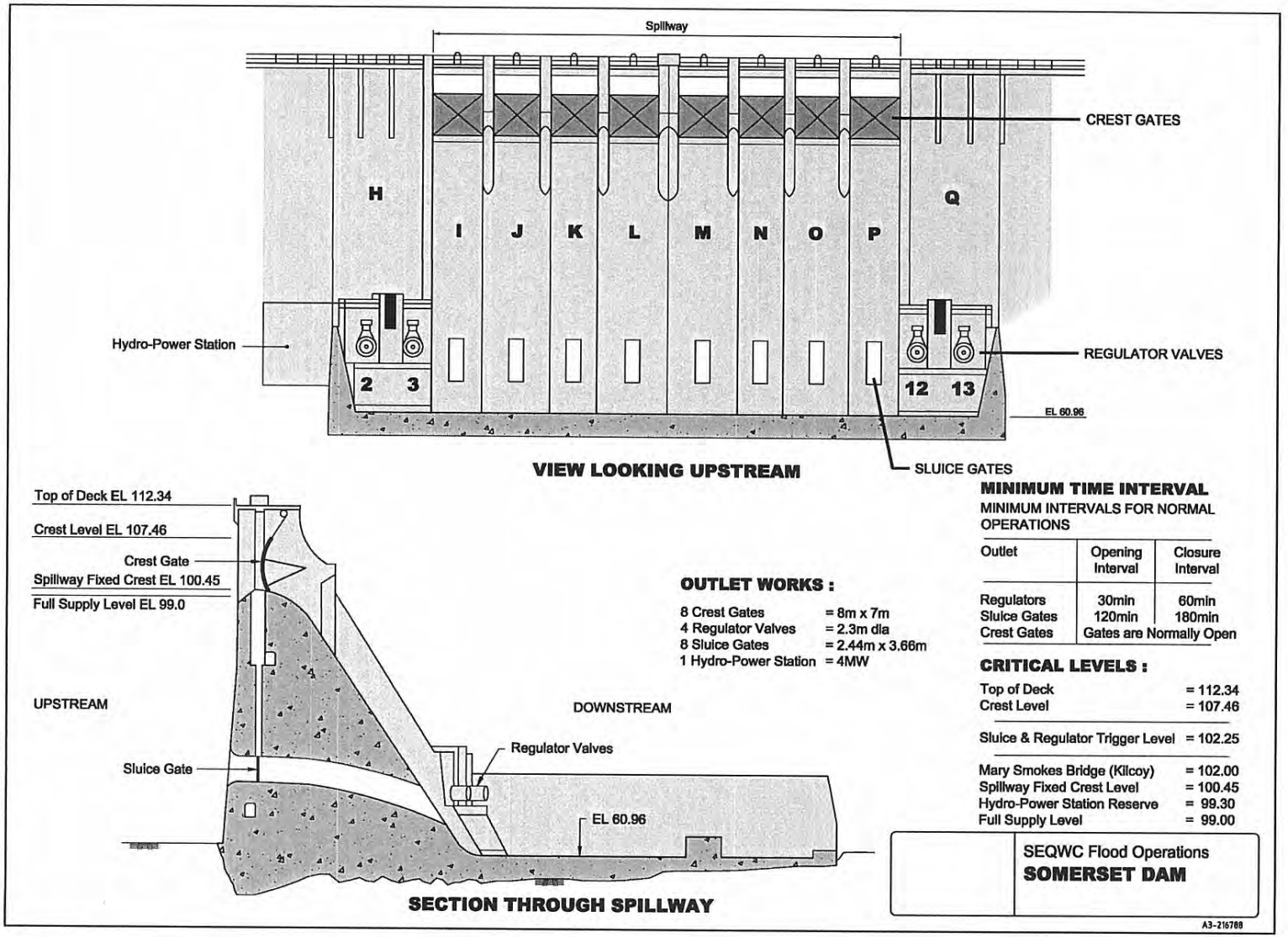
D938

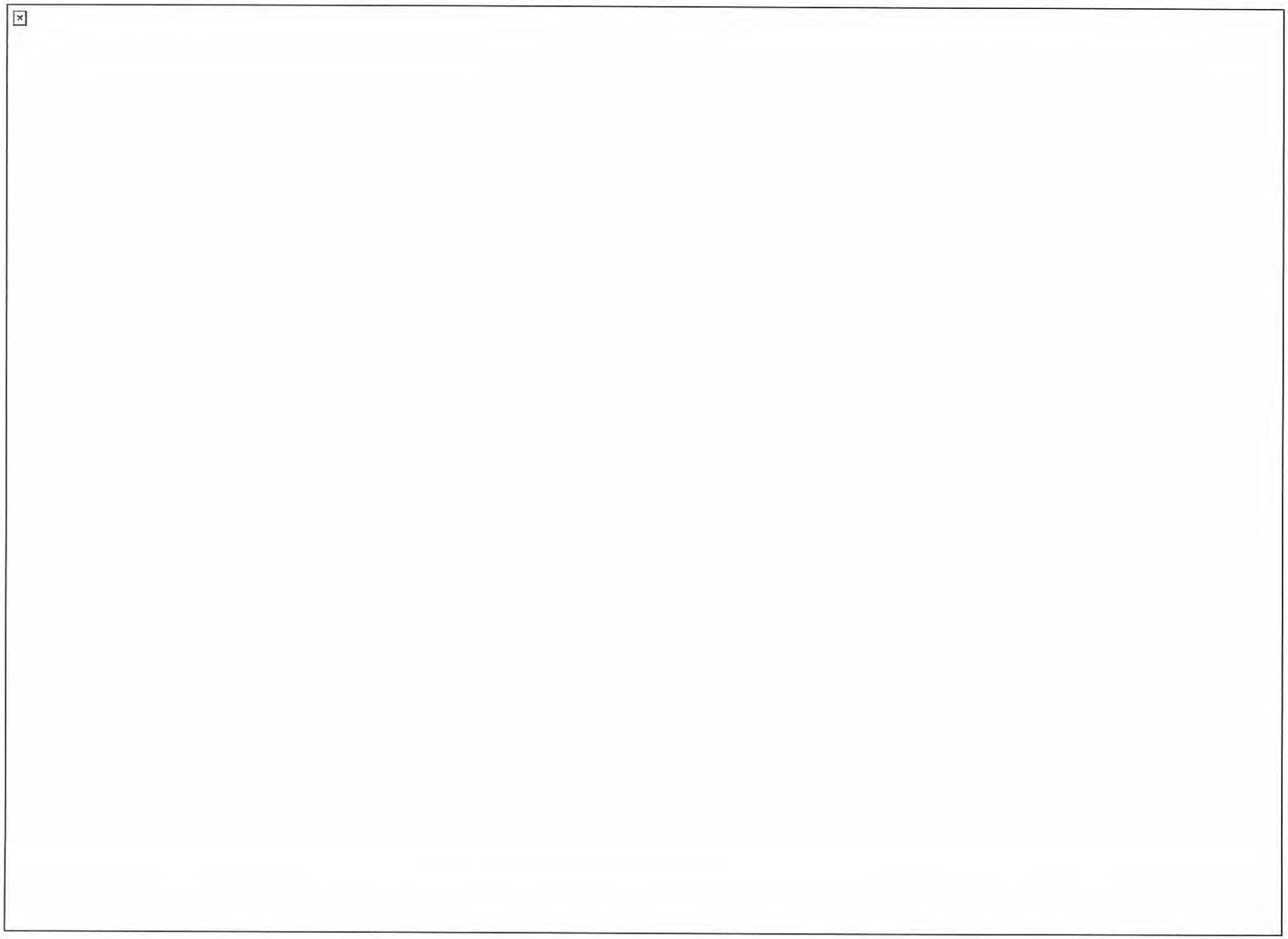

Kilcoy Creek
Deck level - 104.76
Stoney Creek
Deck level - 115.83
Scrubby Creek
Deck level - 107.6
Sandy Creek
Deck level - 114.1
Post Office Creek
Deck level - 114.04
Oakey Creek
Deck level - 108.55
Mary Smokes Creek
Deck level - 102.81
Beam Creek
Deck level - 106.52
Waterfall Gully
Deck level - 112.34
Waterfall Gully 2
Deck level - 114.95
Stanley Gully
Deck level - 112.02
Siverton Creek
Deck level - 77.58
Haslingdens Bridge
Deck level - 76.25
O'Sheas Bridge
Deck level - 76.98
Reedy Creek
3 0 3 6 9
Kilometers
Vertical Datum: Australian Height Datum

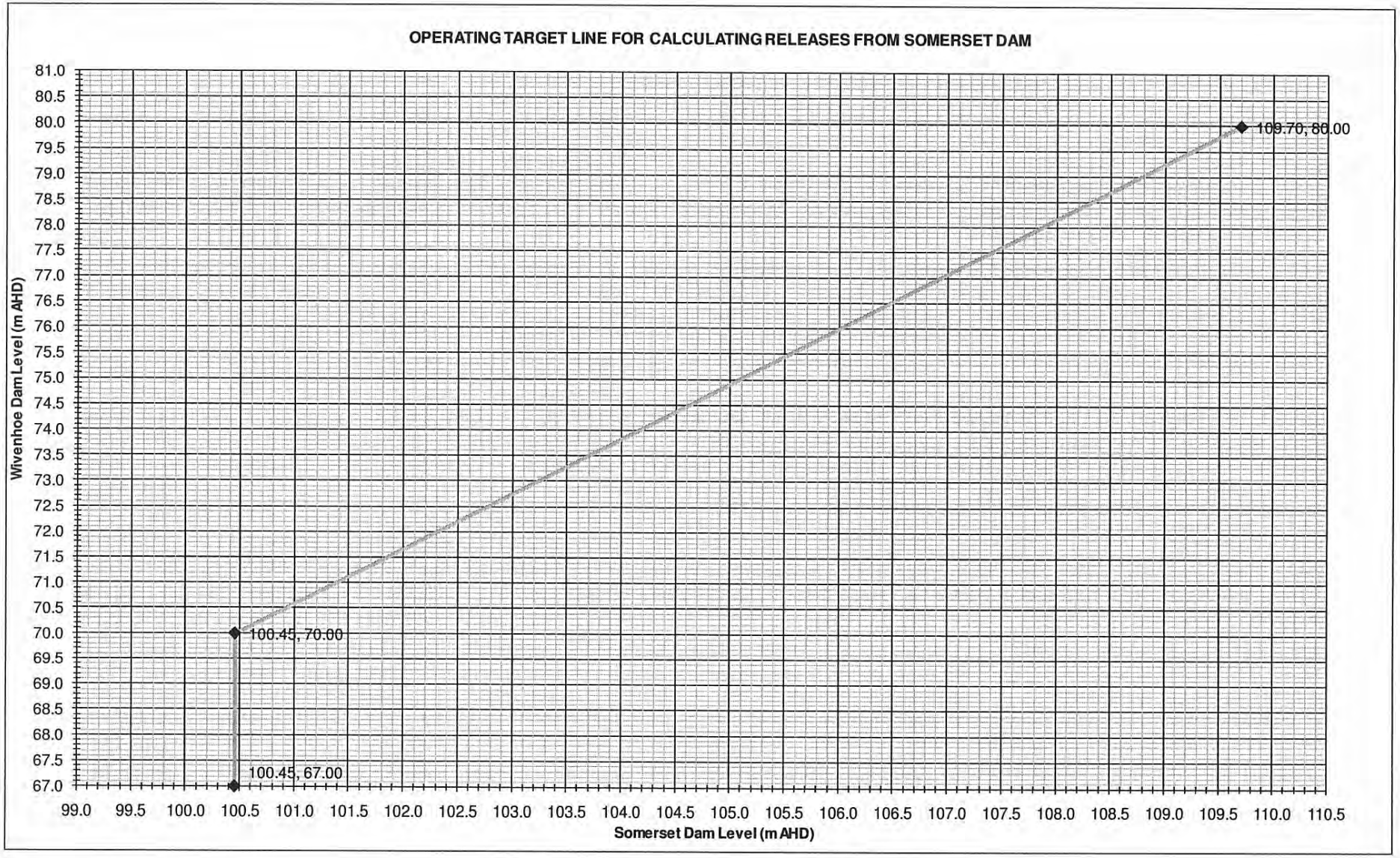
Somerset Dam



D940


Spillway
CREST GATES
H
I
J
K
L
M
N
O
P
Q
Hydro-Power Station
REGULATOR VALVES
2
3
12
13
EL 60.96
SLUICE GATES
VIEW LOOKING UPSTREAM
Top of Deck EL 112.34
Crest Level EL 107.46
Crest Gate
Spillway Fixed Crest EL 100.45
Full Supply Level EL 99.0
UPSTREAM
DOWNSTREAM
Regulator Valves
Sluice Gate
EL 60.96
SECTION THROUGH SPILLWAY
OUTLET WORKS :
8 Crest Gates = 8m x 7m
4 Regulator Valves = 2.3m dia
8 Sluice Gates = 2.44m x 3.66m
1 Hydro-Power Station = 4MW
MINIMUM TIME INTERVAL
MINIMUM INTERVALS FOR NORMAL OPERATIONS
Outlet | Opening Interval | Closure Interval
Regulators | 30min | 60min
Sluice Gates | 120min | 180min
Crest Gates | Gates are Normally Open
CRITICAL LEVELS :
Top of Deck = 112.34
Crest Level = 107.46
Sluice & Regulator Trigger Level = 102.25
Mary Smokes Bridge (Kilcoy) = 102.00
Spillway Fixed Crest Level = 100.45
Hydro-Power Station Reserve = 99.30
Full Supply Level = 99.00
SEQWC Flood Operations
SOMERSET DAM
A3-216788




OPERATING TARGET LINE FOR CALCULATING RELEASES FROM SOMERSET DAM
Wivenhoe Dam Level (m AHD)
Somerset Dam Level (m AHD)
109.70, 80.00
100.45, 70.00
100.45, 67.00
81.0
80.5
80.0
79.5
79.0
78.5
78.0
77.5
77.0
76.5
76.0
75.5
75.0
74.5
74.0
73.5
73.0
72.5
72.0
71.5
71.0
70.5
70.0
69.5
69.0
68.5
68.0
67.5
67.0
99.0
99.5
100.0
100.5
101.0
101.5
102.0
102.5
103.0
103.5
104.0
104.5
105.0
105.5
106.0
106.5
107.0
107.5
108.0
108.5
109.0
109.5
110.0
110.5

APPENDIX J
WIVENHOE DAM – FUSE PLUG BREACH SCENARIOS

SCENARIO 1 – CENTRAL FUSE PLUG BAY INITIATED
(LEFT SIDE BAY AND RIGHT SIDE BAY INTACT)

Storage Level	Gate 1 Opening	Gate 2 Opening	Gate 3 Opening	Gate 4 Opening	Gate 5 Opening	Total Opening	Discharge	Gate Operated
m AHD	(m)	(m)	(m)	(m)	(m)	(m)	cumecs	
67.00	0.0	0.0	0.0	0.0	0.0	0.0	0	
67.75	0.0	0.0	0.5	0.0	0.0	0.5	51	3
68.25	0.0	0.0	1.0	0.0	0.0	1.0	104	3
68.65	0.0	0.0	1.5	0.0	0.0	1.5	158	3
68.80	0.0	0.0	2.0	0.0	0.0	2.0	211	3
68.95	0.0	0.0	2.5	0.0	0.0	2.5	264	3
69.25	0.0	0.0	3.0	0.0	0.0	3.0	317	3
69.40	0.0	0.0	3.5	0.0	0.0	3.5	320	3
69.55	0.0	0.5	3.5	0.0	0.0	4.0	426	2
70.00	0.0	0.5	3.5	0.5	0.0	4.5	492	4
70.30	0.0	0.5	4.0	0.5	0.0	5.0	547	3
70.60	0.0	1.0	4.0	0.5	0.0	5.5	612	2
70.70	0.0	1.0	4.0	1.0	0.0	6.0	671	4
70.90	0.5	1.0	4.0	1.0	0.0	6.5	731	1
71.10	0.5	1.0	4.0	1.0	0.5	7.0	800	5
71.20	0.5	1.5	4.0	1.0	0.5	7.5	860	2
71.40	0.5	1.5	4.0	1.5	0.5	8.0	923	4
71.60	1.0	1.5	4.0	1.5	0.5	8.5	989	1
71.70	1.0	1.5	4.0	1.5	1.0	9.0	1054	5
71.90	1.0	2.0	4.0	1.5	1.0	9.5	1120	2
72.10	1.0	2.0	4.0	2.0	1.0	10.0	1185	4
72.20	1.5	2.0	4.0	2.0	1.0	10.5	1251	1
72.40	1.5	2.0	4.0	2.0	1.5	11.0	1320	5
72.60	1.5	2.5	4.0	2.0	1.5	11.5	1396	2
72.65	1.5	2.5	4.0	2.5	1.5	12.0	1454	4
72.70	1.5	2.5	4.5	2.5	1.5	12.5	1505	3
72.75	2.0	2.5	4.5	2.5	1.5	13.0	1573	1
72.85	2.0	2.5	4.5	2.5	2.0	13.5	1634	5
72.90	2.5	2.5	4.5	2.5	2.0	14.0	1700	1
72.95	2.5	3.0	4.5	2.5	2.5	15.0	1825	5,2
73.00	2.5	3.0	4.5	3.0	2.5	15.5	1884	4
73.10	2.5	3.5	4.5	3.0	2.5	16.0	1946	2
73.20	2.5	3.5	4.5	3.5	2.5	16.5	2014	4
73.30	3.0	3.5	4.5	3.5	3.0	17.5	2139	1,5
73.40	3.0	4.0	4.5	3.5	3.0	18.0	2205	2
73.50	3.0	4.0	4.5	4.0	3.0	18.5	2266	4
73.60	3.5	4.0	5.0	4.0	3.0	19.5	2387	3,1
73.70	3.5	4.0	5.0	4.0	3.5	20.0	2462	5

D944

73.80	3.5	4.5	5.0	4.0	3.5	20.5	2530	2
Storage Level	**Gate 1 Opening**	**Gate 2 Opening**	**Gate 3 Opening**	**Gate 4 Opening**	**Gate 5 Opening**	**Gate Openings**	**Discharge**	**Gate Operated**
m AHD	**(m)**	**(m)**	**(m)**	**(m)**	**(m)**	**(m)**	**cumecs**	
73.90	4.0	4.5	5.0	4.5	3.5	21.5	2653	4,1
74.10	4.5	4.5	5.0	4.5	4.5	23.0	2848	5,1
74.20	5.0	5.0	5.5	5.0	5.0	25.5	3147	3,2,4,1,5
74.30	5.5	5.5	6.0	5.5	5.5	28.0	3438	3,2,4,1,5
74.40	6.0	6.0	6.5	6.0	6.0	30.5	3741	3,2,4,1,5
74.50	6.5	6.5	7.0	6.5	6.5	33.0	4063	3,2,4,1,5
74.60	7.0	7.0	7.0	7.0	7.0	35.0	4280	2,4,1,5
74.70	7.5	7.5	7.5	7.5	7.5	37.5	4575	3,2,4,1,5
74.80	8.5	8.5	9.0	8.5	8.5	43.0	5240	3,2,4,1,5
74.90	9.5	9.5	10.0	9.5	9.5	48.0	5872	3,2,4,1,5
75.00	10.0	11.0	11.0	11.0	10.0	53.0	6653	3,2,4,1,5
75.10	12.0	12.0	12.0	12.0	12.0	60.0	7500	3,2,4,1,5
75.20	13.0	13.0	13.0	13.0	13.0	65.0	8265	3,2,4,1,5
75.30	13.0	13.5	13.5	13.5	13.0	66.5	8529	3,2,4
75.50	13.5	13.5	13.5	13.5	13.5	67.5	8745	1,5
≥75.70	17.5	17.5	17.5	17.5	17.5	Fully Open	10515	3,2,4,1,5

SCENARIO 2 – CENTRAL AND RIGHT SIDE FUSE PLUG BAYS INITIATED (LEFT SIDE BAY INTACT)

Storage Level	**Gate 1 Opening**	**Gate 2 Opening**	**Gate 3 Opening**	**Gate 4 Opening**	**Gate 5 Opening**	**Total Opening**	**Discharge**	**Gate Operated**
m AHD	**(m)**	**(m)**	**(m)**	**(m)**	**(m)**	**(m)**	**cumecs**	
67.00	0.0	0.0	0.0	0.0	0.0	0.0	0	
72.95	0.5	0.5	0.5	0.5	0.5	2.5	310	3,2,4,1,5
73.40	1.0	1.0	1.0	1.0	1.0	5.0	625	3,2,4,1,5
73.80	1.5	1.5	1.5	1.5	1.5	7.5	950	3,2,4,1,5
74.20	2.0	2.0	2.0	2.0	2.0	10.0	1280	3,2,4,1,5
74.60	2.5	2.5	2.5	2.5	2.5	12.5	1610	3,2,4,1,5
74.70	2.5	2.5	3.5	2.5	2.5	13.5	1740	3
74.80	3.5	3.5	3.5	3.5	3.5	17.5	2245	2,4,1,5
74.90	4.5	4.5	4.5	4.5	4.5	22.5	2860	3,2,4,1,5
75.00	6.0	6.0	6.0	6.0	6.0	30.0	3755	3,2,4,1,5
75.10	7.0	7.0	7.0	7.0	7.0	35.0	4350	3,2,4,1,5
75.20	8.5	8.5	8.5	8.5	8.5	42.5	5255	3,2,4,1,5
75.30	8.5	9.0	9.0	9.0	8.5	44.0	5453	3,2,4,
75.70	11.5	11.5	11.5	11.5	11.5	57.5	7290	3,2,4,1,5
≥76.20	17.5	17.5	17.5	17.5	17.5	Fully Open	10970	3,2,4,1,5

D945

SCENARIO 2 – CENTRAL, RIGHT SIDE AND LEFT SIDE FUSE PLUG BAYS INITIATED (NO BAYS INTACT)

Storage Level	Gate 1 Opening	Gate 2 Opening	Gate 3 Opening	Gate 4 Opening	Gate 5 Opening	Gate Openings	Discharge	Gate Operated
m AHD	(m)	(m)	(m)	(m)	(m)	(m)	cumecs	
67.00	0.0	0.0	0.0	0.0	0.0	0.0	0	
72.95	0.5	0.5	0.5	0.5	0.5	2.5	310	3,2,4,1,5
73.40	1.0	1.0	1.0	1.0	1.0	5.0	625	3,2,4,1,5
73.80	1.5	1.5	1.5	1.5	1.5	7.5	950	3,2,4,1,5
74.20	2.0	2.0	2.0	2.0	2.0	10.0	1280	3,2,4,1,5
74.60	2.5	2.5	2.5	2.5	2.5	12.5	1610	3,2,4,1,5
75.00	3.0	3.0	3.0	3.0	3.0	15.0	1950	3,2,4,1,5
75.30	3.0	3.5	3.5	3.5	3.0	16.5	2154	3,2,4
75.40	3.5	3.5	3.5	3.5	3.5	17.5	2285	1,5
75.70	6.0	6.0	6.0	6.0	6.0	30.0	3835	3,2,4,1,5
76.20	11.5	11.5	11.5	11.5	11.5	57.5	7430	3,2,4,1,5
≥76.80	17.5	17.5	17.5	17.5	17.5	Fully Open	11530	3,2,4,1,5

D946

APPENDIX K
BRIDGES IMPACTED BY FLOOD RELEASES AND ELEVATED STORAGE LEVELS

BRIDGES IMPACTED BY ELEVATED STORAGE LEVELS IN SOMERSET DAM			
BRIDGE NAME	**ROAD**	**BRIDGE DECK ELEVATION (m AHD)**	**LOCAL AUTHORITY**
Mary Smokes Creek	D'Aguilar Highway	102.81	Somerset Regional
Kilcoy Creek	D'Aguilar Highway	104.76	Somerset Regional
Beam Creek	Esk Kilcoy Road	106.52	Somerset Regional
Scrubby Creek	D'Aguilar Highway	107.60	Somerset Regional
Oakey Creek	Esk Kilcoy Road	108.55	Somerset Regional

D947

BRIDGES IMPACTED BY ELEVATED STORAGE LEVELS IN WIVENHOE DAM			
BRIDGE NAME	**ROAD**	**BRIDGE DECK ELEVATION (m AHD)**	**LOCAL AUTHORITY**
Sandy Creek A&PM Conroy Bridge	Wivenhoe Somerset Road	69.61	Somerset Regional
Deep Creek	Wivenhoe Somerset Road	72.95	Somerset Regional
Kipper Creek	Wivenhoe Somerset Road	73.00	Somerset Regional
Meirs Gully	Esk Kilcoy Road	74.63	Somerset Regional
Tea Tree Creek	Brisbane Valley Highway	74.82	Somerset Regional
Logan Creek	Brisbane Valley Highway	74.88	Somerset Regional
Five Mile Creek	Brisbane Valley Highway	75.81	Somerset Regional
Reedy Creek	Wivenhoe Somerset Road	75.90	Somerset Regional
Stanley River Haslingdens Bridge	Esk Kilcoy Road	76.25	Somerset Regional
Coal Creek	Brisbane Valley Highway	76.51	Somerset Regional
Brisbane River O'Sheas Bridge	Esk Kilcoy Road	76.98	Somerset Regional
Tea Tree Gully	Brisbane Valley Highway	77.90	Somerset Regional
Middle Creek	Wivenhoe Somerset Road	78.70	Somerset Regional

D948

BRIDGES IMPACTED BY FLOOD RELEASES FROM WIVENHOE DAM			
BRIDGE NAME	**ROAD**	**SUBMERGENCE FLOW AND BRIDGE DECK ELEVATION**	**LOCAL AUTHORITY**
Twin Bridges	Wivenhoe Pocket Road	50 m^3/s 20.0 m AHD	Somerset Regional
Savages Crossing	Banks Creek Road	130 m^3/s 20.6 m AHD	Somerset Regional
Colleges Crossing*	Mt Crosby Road	175 - 200 m^3/s -	Brisbane/Ipswich City Councils
Burtons Bridge	E Summerville Road	430 m^3/s 19.6 m AHD	Somerset Regional
Kholo Bridge	Kholo Road	550 m^3/s 11.9 m AHD	Brisbane/Ipswich City Councils
Mt Crosby Weir	Allawah Road	1900 m^3/s 12.4 m AHD	Brisbane/Ipswich City Councils
Fernvale Bridge	Brisbane Valley Highway	2000 m^3/s 33.8 m AHD	Somerset Regional

* Affected by tidal flows.

D949

From: Bradley John [redacted]
Sent: Wednesday, January 19, 2011 9:35 AM
To: Barry Dennie [redacted]
Cc: Dan Spille [redacted]
Subject: FW: Operational Procedures
Attach: WD-SD-Rev 7 -FINAL_Uncontrolled Copy.pdf

Thanks Dan and Barry –

Pls have [redacted] liaise with [redacted] in [redacted] office re his needs for a draft release.

Also, pls forward me a copy of the draft comms protocol for review as soon as available.

Thanks

John Bradley
Director-General
Department of Environment and Resource Management
[redacted]
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: Dan Spiller [redacted]
Sent: Wednesday, 19 January 2011 9:29 AM
To: Bradley John
Cc: Dennien Barry @ SEQWGM
Subject: Operational Procedures

John,

Procedures as provided to us by Seqwater.

Dan

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

+--+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+--+



MANUAL

OF

OPERATIONAL PROCEDURES

FOR

FLOOD MITIGATION

AT

WIVENHOE DAM

AND

SOMERSET DAM

Uncontrolled Copy

Revision 7
November 2009

Revision No.	Date	Amendment Details
0	27 October 1968	Original Issue
1	6 October 1992	Complete revision and re-issue
2	13 November 1997	Complete revision and re-issue
3	24 August 1998	Change to page 23
4	6 September 2002	Complete revision and re-issue
5	4 October 2004	Complete revision
6	20 December 2004	Miscellaneous amendments and re-issue
7	November 2009	Complete Revision

TABLE OF CONTENTS

1 INTRODUCTION 1

1.1 Preface 1
1.2 Meaning of Terms 1
1.3 Purpose of Manual 3
1.4 Legal Authority 3
1.5 Application and Effect 3
1.6 Date of Effect 3
1.7 Observance of Manual 4
1.8 Provision for Variations to Manual 4
1.9 Distribution of Manual 4

2 DIRECTION OF OPERATIONS 5

2.1 Statutory Operation 5
2.2 Operational Arrangements 5
2.3 Designation and Responsibilities of Senior Flood Operations Engineer 5
2.4 Designation and Responsibilities of Flood Operations Engineer 6
2.5 Qualifications and Experience of Engineers 6
2.6 Schedule of Authorities 7
2.7 Training 7
2.8 Reasonable Discretion 7
2.9 Report 8

3 FLOOD MITIGATION OBJECTIVES 9

3.1 General 9
3.2 Structural Safety of Dams 9
3.3 Inundation of Urban Areas 10
3.4 Disruption to Rural Areas 10
3.5 Retain the storage at Full Supply Level at the Conclusion of the Flood Event 11
3.6 Minimising Impacts to Riparian Flora and Fauna 11

4 FLOOD CLASSIFICATION 12

D953

5 FLOOD MONITORING AND FORECASTING SYSTEM 13

5.1 General 13
5.2 Operation 13
5.3 Storage of Documentation 14
5.4 Key Reference Gauges 14
5.5 Reference Gauge Values 14

6 COMMUNICATIONS 15

6.1 Communications between Staff 15
6.2 Dissemination of Information 15
6.3 Release of Information to the Public 16

7 REVIEW 17

7.1 Introduction 17
7.2 Personnel Training 17
7.3 Monitoring and Forecasting System and Communication Networks 17
7.4 Operational Review 17
7.5 Five Yearly Review 18

8 WIVENHOE DAM FLOOD OPERATIONS 19

8.1 Introduction 19
8.2 Flood Release Infrastructure 19
8.3 Initial Flood Control Action 21
8.4 Flood Operations Strategies 22
8.5 Gate Closing Strategies 31
8.6 Gate Operation Sequences 31
8.7 Modification to Flood Operating Procedures if a Fuse Plug Triggers 36
8.8 Modification to Flood Operating Procedures if a subsequent flood event occurs prior to the reconstruction of Triggered Fuse Plugs 36

9 SOMERSET DAM FLOOD OPERATIONS 37

9.1 Introduction 37
9.2 Initial Flood Control Action 37
9.3 Flood Operations Strategies 37
9.4 Gate Closing Strategies 41
9.5 Gate Operation Sequences 42

10 EMERGENCY FLOOD OPERATIONS 43

10.1 Introduction 43

10.2 Overtopping of Dams 43

10.3 Communications Failure 43

10.4 Equipment Failure 49

APPENDIX A – AGENCIES HOLDING CONTROLLED COPIES OF THIS MANUAL

APPENDIX B – KEY REFERENCE GAUGES

APPENDIX C – WIVENHOE DAM TECHNICAL DATA

APPENDIX D – SOMERSET DAM TECHNICAL DATA

APPENDIX E – WIVENHOE DAM GATE OPERATION CONSIDERATIONS

APPENDIX F – SOMERSET DAM AUXILIARY EQUIPMENT

APPENDIX G – HYDROLOGIC INVESTIGATIONS

APPENDIX H – WIVENHOE DAM (PLANS, MAPS AND PHOTOGRAPHS)

APPENDIX I – SOMERSET DAM (PLANS, MAPS AND PHOTOGRAPHS)

APPENDIX J – WIVENHOE DAM – FUSE PLUG BREACH SCENARIOS

APPENDIX K – BRIDGES IMPACTED BY FLOOD RELEASES AND ELEVATED STORAGE LEVELS

1 INTRODUCTION

1.1 Preface

Given their potential significant impact on downstream populations, it is imperative that Wivenhoe and Somerset Dams be operated during flood events in accordance with clearly defined procedures to minimise impacts to life and property. This manual outlines these procedures and is an approved Flood Mitigation Manual under Water Supply Act 2008.

The Manual in its current form was developed in 1992 and the basis of this document was a manual written in 1968 covering flood operations at Somerset Dam (Wivenhoe Dam was completed in 1984). Six revisions of the Manual have occurred since 1992 to account for updates to the Flood Alert Network and the Real Time Flood Models, the construction of an Auxiliary Spillway at Wivenhoe Dam in 2005 and to account for institutional and legislative changes.

The primary objectives of the procedures contained in this Manual are essentially the same as those contained in previous Manual versions. These objectives in order of importance are:

- Ensure the structural safety of the dams;
- Provide optimum protection of urbanised areas from inundation;
- Minimise disruption to rural life in the valleys of the Brisbane and Stanley Rivers;
- Retain the storage at Full Supply Level at the conclusion of the Flood Event.
- Minimise impacts to riparian flora and fauna during the drain down phase of the Flood Event.

In meeting these objectives, the dams must be operated to account for the potential effects of closely spaced Flood Events. Accordingly, normal procedures require stored floodwaters to be emptied from the dams within seven days of the flood event peak passing through the dams.

Wivenhoe Dam and Somerset Dam are operated in conjunction so as to maximise the overall flood mitigation capabilities of the two dams. The procedures outlined in this Manual are based on the operation of the dams in tandem.

1.2 Meaning of Terms

In this Manual, save where a contrary definition appears -

"Act" means the *Water Supply (Safety and Reliability) Act 2008*;

"AEP" means annual exceedance probability, the probability of a specified event being exceeded in any year.

"Agency" includes a person, a local government and a department of state government within the meaning of the Acts Interpretation Act 1954;

D956

"AHD" means Australian Height Datum;

"Chairperson" means the Chairperson of Seqwater;

"Chief Executive" means the Director General of the Department of Environment and Resource Management or nominated delegate;

"Controlled Document" means a document subject to managerial control over its contents, distribution and storage. It may have legal and contractual implications;

"Dams" means dams to which this Manual applies, that is Wivenhoe Dam and Somerset Dam;

"Dam Supervisor" means the senior on-site officer at Wivenhoe or Somerset Dam as the case may be;

"Duty Flood Operations Engineer" means the Senior Flood Operations Engineer or Flood Operations Engineer rostered on duty to be in charge of Flood Operations at the dams;

"EL" means elevation in metres Australian Height Datum;

"Flood Event" is a situation where the Duty Flood Operations Engineer expects the water level in either of the Dams to exceed the Full Supply Level;

"Flood Operations Centre" means the Centre used during by Flood Operations Engineers to manage Flood Events;

"Flood Operations Engineer" means a person designated to direct flood operations at the dams in accordance with Section 2.4 of this Manual;

"FSL" or "Full Supply Level" means the level of the water surface when the reservoir is at maximum operating level, excluding periods of flood discharge;

"Gauge" when referred to in (m) means river level referenced to AHD, and when referred to in (m^3/s) means flow rate in cubic metres per second;

"Manual" or "Manual of Operational Procedures for Flood Events at Wivenhoe Dam and Somerset Dam" means the current version of this Manual;

"Power Station" means the Wivenhoe pumped storage hydro-electric power station associated with Wivenhoe Dam and Split-Yard Creek Dam;

"Senior Flood Operations Engineer" means a person designated in accordance with Section 2.3 of this Manual under whose general direction the procedures in this Manual must be carried out;

"Seqwater" means the Queensland Bulk Water Supply Authority trading as Seqwater.

D957

1.3 Purpose of Manual

The purpose of this Manual is to define procedures for the operation of Wivenhoe Dam and Somerset Dam to reduce, so far as practicable, the effects of flooding associated with the dams. This is achieved by the proper control and regulation in time of the flood release infrastructure at the dams, with due regard to the safety of the dam structures.

The procedures in this Manual have been developed on the basis that the community is to be protected to the maximum extent practical against flood hazards recognising the limitations on being able to:

- Obtain accurate forecasts of rainfall during flood events;
- Accurately estimate flood run-off within the dam catchments;
- Identify all potential flood hazards and their likelihood;
- Remove or reduce community vulnerability to flood hazards;
- Effectively respond to flooding;
- Provide resources in a cost effective manner.

1.4 Legal Authority

This manual has been prepared as a Flood Mitigation Manual in accordance with Chapter 4 Part 2 of the Act.

1.5 Application and Effect

The procedures in this Manual apply to the operation of Wivenhoe Dam and Somerset Dam for the purpose of flood mitigation, and operation in accordance with the manual shall give the protection from liability provided by Section 374 of the Act.

1.6 Date of Effect

The procedures in this Manual shall have effect on and from the date on which this version of the Manual is approved by gazette notice.

The Manual shall remain in force for the period of approval as determined by the Chief Executive. This approval may be for a period of up to five years.

Before the approval of the Manual expires, Seqwater must review and if necessary update the Manual and submit a copy to the chief executive for approval.

1.7 Observance of Manual

This Manual contains the operational procedures for Wivenhoe Dam and Somerset Dam for the purposes of flood mitigation and must be used for the operation of the dams during flood events.

1.8 Provision for Variations to Manual

If Seqwater is of the opinion that this Manual should be amended, altered or varied, it must submit for approval as soon as practical, an appropriate request to the Chief Executive, setting out the circumstances and the exact nature of the amendment, alteration or variation sought. The Chief Executive may accept, reject or modify the request prior to approval.

1.9 Distribution of Manual

Seqwater must regard the manual as a Controlled Document and ensure that only controlled manuals are used in the direction of flood mitigation activities. Agencies having copies of controlled hardcopies of the Manual are listed in Appendix A. Seqwater must maintain a Register of Contact Persons for issued controlled hardcopies of the Manual and must ensure that each issued document is updated whenever amendments or changes are approved.

D959

2 DIRECTION OF OPERATIONS

2.1 Statutory Operation

Pursuant to the provisions of the Act, Seqwater is responsible for operating and maintaining the dams in accordance with this Manual in order to retain the protection from liability afforded by the Act. Operators, employees, agents, and contractors working for Seqwater must also comply with this Manual to obtain the protection of the Act.

2.2 Operational Arrangements

For the purposes of operation of the dams during Flood Events, Seqwater must ensure that:

- Sufficient numbers of suitably qualified personnel are available to operate the dams if a Flood Event occurs.
- Sufficient numbers of suitably qualified personnel are available to operate the Flood Operations Centre if a Flood Event occurs
- A Duty Flood Operations Engineer is on call at all times. The Duty Flood Operations Engineer must constantly review weather forecasts and catchment rainfall and must declare a Flood Event if the water level of either Wivenhoe or Somerset Dam is expected to exceed Full Supply Level as a result of prevailing or predicted weather conditions.
- A Senior Flood Operations Engineer is designated to be in the charge of Flood Operations at all times during a Flood Event.
- Release of water at the dams during Flood Events is carried out under the direction of the Duty Flood Operations Engineer.
- All practical attempts are made to liaise with the Chairperson and the Chief Executive if the release of water from the Dams during a Flood Event is likely to endanger life or property.

2.3 Designation and Responsibilities of Senior Flood Operations Engineer

Seqwater must nominate one or more suitably qualified and experienced persons to undertake the role of Senior Flood Operations Engineer. If approved by the Chief Executive, these persons can be authorised in the Schedule of Authorities (see Section 2.6). When rostered on duty during a Flood Event, the responsibilities of the Senior Flood Engineer are as follows:

- Set the overall strategy for management of the Flood Event in accordance with the objectives of this Manual.
- Provide instructions to site staff to make releases of water from the Dams during Flood Events that are in accordance with this Manual.
- Apply reasonable discretion in managing a Flood Event as described in Section 2.8.

D960

Seqwater must ensure that an adequate number of Senior Flood Operations Engineers are available to manage all Flood Events.

2.4 Designation and Responsibilities of Flood Operations Engineer

Seqwater must nominate one or more suitably qualified and experienced persons to undertake the role of Flood Operations Engineer. If approved by the Chief Executive, these persons can be authorised in the Schedule of Authorities (see Section 2.6). When rostered on duty during a Flood Event, the responsibilities of the Flood Engineer are as follows:

- Direct the operation of the dams during a flood event in accordance with the general strategy determined by the Senior Flood Operations Engineer.
- Follow any direction from the Senior Flood Operations Engineer in relation to applying reasonable discretion in managing a Flood Event as described in Section 2.8. Unless otherwise directed, a Flood Operations Engineer is to follow this Manual in managing Flood Events and is not to apply reasonable discretion unless directed by the Senior Flood Operations Engineer or the Chief Executive.
- Provide instructions to site staff to make releases of water from the Dams during Flood Events that are in accordance with this Manual.

Seqwater must ensure that an adequate number of Flood Operations Engineers are available to manage all Flood Events. Seqwater must also ensure that an adequate number of suitably qualified and experienced persons are available to assist the Flood Operations Engineers during all Floods Events.

2.5 Qualifications and Experience of Engineers

Qualifications

All engineers referred to in Sections 2.3 and 2.4 must hold a Certificate of Registration as a Registered Professional Engineer of Queensland and must hold appropriate engineering qualifications to the satisfaction of the Chief Executive.

Experience

All engineers referred to in Sections 2.3 and 2.4 must, to the satisfaction of the Chief Executive, have:

(1) Knowledge of design principles related to the structural, geotechnical and hydraulic design of large dams, and

(2) At least a total of five years of suitable experience and demonstrated expertise in at least two of the following areas:

D961

- Investigation, design or construction of major dams;
- Operation and maintenance of major dams;
- Hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology;
- Applied hydrology with particular reference to flood forecasting and/or flood forecasting systems.

2.6 Schedule of Authorities

Seqwater must maintain a Schedule of Authorities containing a list of the Senior Flood Operations Engineers and Flood Operations Engineers approved by the Chief Executive to direct flood operations at the dams during floods. A copy of the Schedule of Authority must be provided to the Chief Executive by 30 September of each year.

Seqwater shall nominate suitably qualified and experienced engineers for registration in the Schedule of Authorities as the need arises. Each new nomination must include a validated statement of qualifications and experience as required by the Chief Executive. Seqwater must obtain the approval for all nominations from the Chief Executive prior to their inclusion in the Schedule of Authorities.

If, in the event of unforseen and emergency situations, no Senior Flood Operations Engineer or no Flood Operations Engineer is available from the Schedule of Authorities to manage a Flood Event, Seqwater must temporarily appoint a suitable person or persons and immediately seek ratification from the Chief Executive.

2.7 Training

Seqwater must ensure that operational personnel required for flood operations activities receive adequate training in the various activities involved in flood control operation as required by the Chief Executive.

2.8 Reasonable Discretion

If in the opinion of the Senior Flood Operations Engineer, it is necessary to depart from the procedures set out in this Manual to meet the flood mitigation objectives set out in Section 3, the Senior Flood Operations Engineer is authorised to adopt such other procedures as considered necessary subject to the following:

- Before exercising discretion under this Section of the Manual with respect to flood mitigation operations, the Senior Flood Operations Engineer must make a reasonable attempt to consult with both the Chairperson and Chief Executive.
- The Chief Executive would normally authorise any departures from the Manual. However if the Chief Executive cannot be contacted within a reasonable time, departures from the Manual can be authorised by the Chairperson.
- If both the Chairperson and the Chief Executive cannot be contacted within a reasonable time, the Senior Flood Operations Engineer may proceed with the procedures considered

D962

necessary and report such action at the earliest opportunity to the Chairperson and Chief Executive.

2.9 Report

Seqwater must prepare a report after each Flood Event. The report must contain details of the procedures used, the reasons therefore and other pertinent information. Seqwater must forward the report to the Chief Executive within six weeks of the completion of the Flood Event.

D963

3 FLOOD MITIGATION OBJECTIVES

3.1 General

To meet the purpose of the flood operational procedures in this Manual, the following objectives, listed in descending order of importance, are as follows:

- Ensure the structural safety of the dams;
- Provide optimum protection of urbanised areas from inundation;
- Minimise disruption to rural life in the valleys of the Brisbane and Stanley Rivers;
- Retain the storage at Full Supply Level at the conclusion of the Flood Event.
- Minimise impacts to riparian flora and fauna during the drain down phase of the Flood Event.

In meeting these objectives, the dams must be operated to account for the potential effects of closely spaced Flood Events. Accordingly, normal procedures require stored floodwaters to be emptied from the dams within seven days of the flood event peak passing through the dams.

Additionally, the auxiliary spillway constructed at Wivenhoe Dam in 2005 incorporates fuse plugs. Triggering of a fuse plug will increase floods levels downstream. Where possible, gate operations at both Wivenhoe and Somerset dams should be formulated to prevent operation of the fuse plug. This potential scenario is possible only when the forecast peak water level for Wivenhoe Dam just exceeds the trigger level for the fuse plug and sufficient time is available to alter releases.

3.2 Structural Safety of Dams

The structural safety of the dams must be the first consideration in the operation of the dams for the purpose of flood mitigation.

Wivenhoe Dam

The structural safety of Wivenhoe Dam is of paramount importance. Structural failure of Wivenhoe Dam would have catastrophic consequences. Wivenhoe Dam is predominantly a central core rockfill dam. Such dams are not resistant to overtopping and are susceptible to breaching should such an event occur. Overtopping is considered a major threat to the security of Wivenhoe Dam. Wivenhoe Dam is overtopped by an event with a 1 in 100,000 AEP.

Somerset Dam

The structural safety of Somerset Dam also is of paramount importance. Failure of Somerset Dam could have catastrophic consequences. Whilst Wivenhoe Dam has the capacity to mitigate the flood effects of such a failure in the absence of any other flooding, if the failure were to occur during major flooding, Wivenhoe Dam could be overtopped and destroyed also.

D964

Somerset Dam is a mass concrete dam. Such dams can withstand limited overtopping without damage. Failure of such structures is rare but when they do occur, they occur suddenly without warning, creating very severe and destructive flood waves. Although Somerset Dam is overtopped by an event with a 1 in 5,000 AEP, it is expected that the dam could withstand at least 2.2 metres of overtopping without failure, provided all radial gates are fully open. This equates to an event centred on the Somerset Dam catchment with a 1 in 20,000 AEP.

Extreme Floods and Closely Spaced Large Floods

As indicated in the previous section, techniques for estimating extreme floods show that floods are possible which would overtop both dams. In the case of Wivenhoe Dam such an overtopping would most likely result in the destruction of the dam. Such events however require several days of intense rainfall to produce the necessary runoff.

Historical records show that there is a significant probability of two or more flood producing storms occurring in the Brisbane River system within a short time of each other. Therefore, unless determined otherwise by the Senior Flood Operations Engineer in accordance with Section 2.8, the aim during a Flood Event should be to empty stored floodwaters within seven days after the flood peak has passed through the dams. In a very large flood, this time frame may not be achievable because of downstream flood conditions and it may be necessary to extend the emptying period by several days.

The discharges from the dams should be regulated so as to have little impact on the urban reaches of the Brisbane River, taking into account inflows into the river downstream of the dams. However the seven day drainage requirement may result in submergence of some bridges. Regardless, the level of flooding as a result of emptying stored floodwaters after the peak has passed is to be less than the flood peak unless accelerated release is necessary to reduce the risk of overtopping.

3.3 Inundation of Urban Areas

The prime purpose of incorporating flood mitigation measures into Wivenhoe Dam and Somerset Dam is to reduce flooding in the urban areas of the flood plains below Wivenhoe Dam. The peak flows of floods emanating from the upper catchments of Brisbane and Stanley Rivers can be reduced by controlling flood releases from the dams, while taking into account flooding derived from the lower Brisbane River catchments.

3.4 Disruption to Rural Areas

While the dams are being used for flood mitigation purposes, bridges and areas upstream of the dams may be temporarily inundated. Downstream of the dam, bridges and lower river terraces will be submerged. The operation of the dams should not prolong this inundation unnecessarily.

Disruption to navigation in the Brisbane River can also be taken into account when considering disruption to rural areas downstream of the dam. Generally, this consideration is secondary to considerations associated with reducing bridge inundation.

D965

3.5 Retain the storage at Full Supply Level at the Conclusion of the Flood Event

As the dams are the primary urban water supply for South East Queensland, it is important that all opportunities to fill the dams are taken. There should be no reason why the dams should not be full following a Flood Event.

3.6 Minimising Impacts to Riparian Flora and Fauna

During the drain down phase, consideration is to be given to minimising the impacts on riparian flora and fauna. In particular, strategies aimed at reducing fish deaths in the vicinity of the dam walls are to be instigated, provided such procedures do not adversely impact on other flood mitigation objectives.

Additionally, when determining the time interval between successive gate closures consideration should also be given to reducing potential bank slumping. Rapid draw down of stream levels where banks are saturated should be avoided if this can be managed within the other flood mitigation objectives.

D966

4 FLOOD CLASSIFICATION

For the reference purposes of this Manual, four magnitudes of flooding are classified as follows:

Minor Flooding

Causes inconvenience. Low-lying areas next to watercourses are inundated which may require the removal of stock and equipment. Minor roads may be closed and low-level bridges submerged.

Moderate Flooding

In addition to the impacts experienced during Minor Flooding, the evacuation of some houses may be required. Main traffic routes may be impacted. The area of inundation is substantial in rural areas requiring the removal of stock.

Major Flooding

In addition to the impacts experienced during Moderate Flooding, extensive rural areas and/or urban areas are inundated. Properties and towns are likely to be isolated and major traffic routes likely to be closed. Evacuation of people from flood affected areas may be required. The 1974 flood that impacted on the Ipswich and Brisbane areas is classified as a major flood.

Extreme Flooding

This causes flooding impacts equal to or in excess of levels previously experienced. In addition to the impacts experienced during Major Floods, the general evacuation of people from significant populated areas is likely to be required.

It should be noted that a flood may not cause the same category of flooding along its entire length and the relevant agencies shall have regard to this when flooding is predicted. The classifications of minor, moderate and major flooding are based on the Bureau of Meteorology Standard Flood Classifications for Australia.

The current classifications for key reference gauges in the Brisbane River are given in Appendix B.

D967

5 FLOOD MONITORING AND FORECASTING SYSTEM

5.1 General

A real time flood monitoring and forecasting system has been established in the dam catchments. This system employs radio telemetry to collect, transmit and receive rainfall and stream flow information. The system consists of more than 100 field stations that automatically record rainfall and/or river heights at selected locations in the dam catchments. Some of the field stations are owned by Seqwater with the remainder belonging to other agencies.

The rainfall and river height data is transmitted to Seqwater's Flood Operations Centre in real time. Once received in the Flood Operations Centre, the data is processed using a Real Time Flood Model (RTFM) to estimate likely dam inflows and evaluate a range of possible inflow scenarios based on forecast and potential rainfall in the dam catchments. The RTFM is a suite of hydrologic and hydraulic computer programs that utilise the real time data to assist in the operation of the dams during flood events. Seqwater is responsible for providing and maintaining the RTFM and for ensuring that sufficient data is available to allow proper operation of the RTFM during a Flood Event.

5.2 Operation

The Senior Flood Operations and Flood Operations Engineers use the RTFM for flood monitoring and forecasting during flood events to operate the dams in accordance with this Manual. This is done by optimising releases of water from the dams to minimise the impacts of flooding in accordance with the objectives and procedures contained in this Manual.

Seqwater is responsible for improving the operation of the RTFM over time by using the following processes:

- Implementing improvements based on Flood Event audits and reviews.
- Improving RTFM calibration as further data becomes available.
- Updating software in line with modern day standards.
- Improving the coverage and reliability of the data collection network to optimise data availability during Flood Events.
- Recommendations by Senior Flood Operations Engineers.

A regular process of internal audit and management review must be maintained by Seqwater to achieve these improvements.

Seqwater must also maintain a log of the performance of the data collection network. The log must include all revised field calibrations and changes to the number, type and locations of gauges. Senior Flood Operations and Flood Operations Engineers are to be notified of all significant changes to the Log.

D968

Seqwater must also maintain a log of the performance of the RTFM. Any faults to the computer hardware or software are to be noted and promptly and appropriately attend to.

5.3 Storage of Documentation

The performance of any flood monitoring and forecasting system is reliant on accurate historical data over a long period of time. Seqwater must ensure that all available data and other documentation is appropriately collected and catalogued for future use.

5.4 Key Reference Gauges

Key field station locations have been identified for reference purposes when flood information is exchanged between authorities or given to the public. Should it be deemed desirable to relocate field stations from these locations or vary flood classification levels, agreement must first be obtained between Seqwater, Bureau of Meteorology and the Local Government within whose boundaries the locations are situated.

Gauge boards that can be read manually must be maintained by Seqwater as part of the equipment of each key field station. Where possible and practical during Flood events, Seqwater is to have procedures in place for manual reading of these gauge boards in the event of failure of field stations.

5.5 Reference Gauge Values

Other agencies such as the Bureau of Meteorology, Brisbane City Council and Ipswich City Council have direct access to the information from field stations for flood assessment purposes. The consultation between agencies is a very important part of the assessment and prediction of flood flows and heights.

Seqwater must ensure that information relevant to the calibration of its field stations is shared with these agencies.

D969

6 COMMUNICATIONS

6.1 Communications between Staff

Seqwater is responsible for providing and maintaining equipment to allow adequate channels of communication to exist at all times between the Seqwater Flood Operations Centre and site staff at Wivenhoe and Somerset Dams.

6.2 Dissemination of Information

Agencies other than Seqwater have responsibilities for formal flood predictions, the interpretation of flood information and advice to the public associated with Flood Events. Adequate and timely information is to be supplied to agencies responsible for the operation of facilities affected by flooding and for providing warnings and information to the public. Agency information requirements are generally as shown in the table below.

The Senior Flood Operations and Flood Operations Engineers must supply information to each of these agencies during Flood Events. The contact information for these Agencies and communication procedures is contained in the Emergency Action Plans for the dams and each agency is to receive updated controlled copies of these documents.

Seqwater must liaise and consult with these agencies with a view to ensuring all information relative to the flood event is consistent and used in accordance with agreed responsibilities.

AGENCY INFORMATION REQUIREMENTS

Agency	Activity	Information Required from Flood Operations Centre	Trigger
Bureau of Meteorology	Issue of flood warnings for Brisbane River basin	Actual and projected discharges from Wivenhoe Dam Actual and projected discharges from Somerset Dam	Initial gate operations and thereafter at intervals to suit forecasting requirements
Department of Environment and Resource Management	Review of flood operations and discretionary powers	Actual and predicted lake levels and discharges	
Somerset Regional Council	Flood level information upstream of Somerset Dam and upstream and downstream of Wivenhoe Dam	Actual and predicted lake levels, Somerset Dam and actual and predicted lake levels and discharges, Wivenhoe Dam	Somerset Dam water level predicted to exceed EL 102 m AHD and initial Wivenhoe Dam gate operation
Ipswich City Council	Flood level information for Ipswich City area	Nil (information obtained from BOM)	
Brisbane City Council	Flood level information for Brisbane City area	Nil (information obtained from BOM)	

D970

6.3 Release of Information to the Public

Seqwater is responsible for the issue of information regarding storage conditions and current and proposed releases from the dams to the public and the media.

The Bureau of Meteorology has responsibility for issuing flood warnings.

The Emergency Services Response Authorities, under the Disaster Management Act 2003, have responsibility for the preparation of a local counter disaster plan and the interpretation of flood forecast information for inclusion in their local flood warnings prepared under the flood sub plan of the counter disaster plan.

D971

7 REVIEW

7.1 Introduction

With the passage of time neither the technical assumptions nor the physical conditions on which this Manual is based may remain unchanged. It is also recognised that the relevance of the Manual may change with changing circumstances. It is important therefore, that the Manual contain operational procedures which cause the assumptions and conditions upon which they are based, to be checked and reviewed regularly.

This process must involve all personnel involved in the management of Flood Events, to ensure that changes of personnel do not result in a diminished understanding of the basic principles upon which the operational procedures are based. Variations to the Manual may be made in accordance with provisions in Section 1.8.

7.2 Personnel Training

Seqwater must report to the Chief Executive by 30 September each year on the training and state of preparedness of operations personnel.

7.3 Monitoring and Forecasting System and Communication Networks

Seqwater must provide a report to the Chief Executive by 30 September each year on the state of the Flood Monitoring and Forecasting System and Communication Networks. The report must assess following in terms of hardware, software and personnel:

- Adequacy of the communication and data gathering facilities.
- Reliability of the system over the previous period.
- Reliability of the system under prolonged flood conditions.
- Accuracy of forecasting flood flows and heights.
- The overall state of preparedness of the system.

Seqwater must take any action considered necessary for the proper functioning and improvement of this system.

7.4 Operational Review

After each significant flood event, Seqwater must report to the Chief Executive on the effectiveness of the operational procedures contained in this manual. This report must be submitted within six weeks of any flood event that requires mobilisation of the Flood Operations Centre.

D972

7.5 Five Yearly Review

Prior to the expiry of the approval period, Seqwater must review the Manual pursuant to provisions of the Act. The review is to take into account the continued suitability of the communication network and the flood monitoring and forecasting system, as well as hydrological and hydraulic engineering assessments of the operational procedures.

D973

8 WIVENHOE DAM FLOOD OPERATIONS

8.1 Introduction

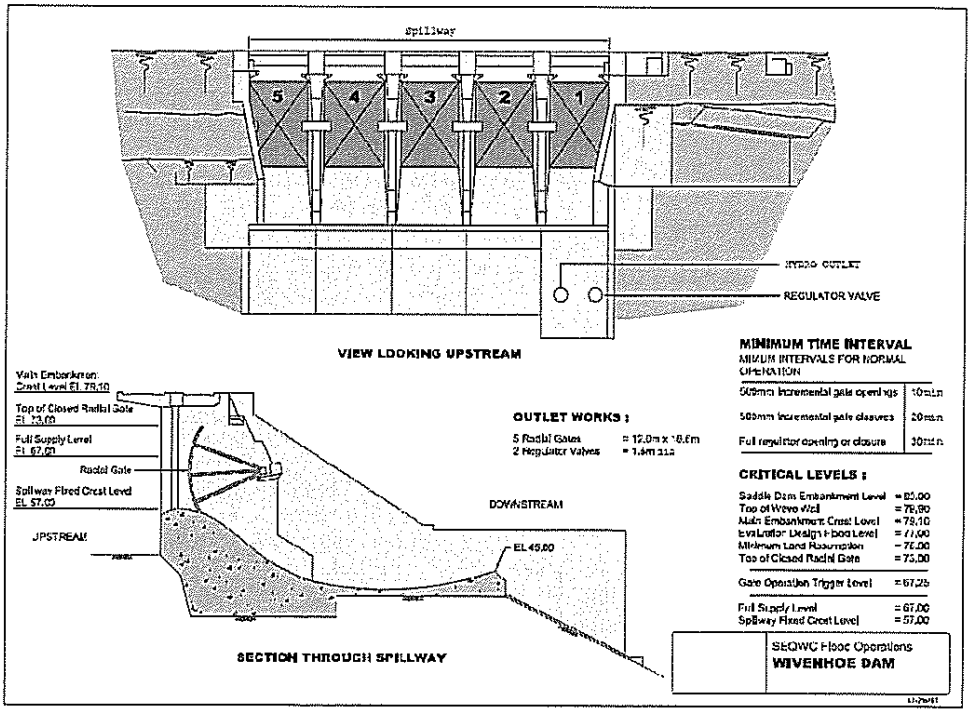
Wivenhoe Dam is capable of being operated in a number of ways to reduce flooding in the Brisbane River downstream of the dam, depending on the origin, magnitude and spatial extent of the flood. Maximum overall flood mitigation effect will be achieved by operating Wivenhoe Dam in conjunction with Somerset Dam.

The reservoir volume above FSL of EL 67.0 is available as temporary flood storage. How much of the available flood storage compartment is utilised, will depend on the initial reservoir level below FSL, the magnitude of the flood being regulated and the procedures adopted.

Splityard Creek Dam is part of the overall Wivenhoe Area Project and it forms the upper pumped storage for hydro power generation. Splityard Creek Dam impounds a volume of 28,700 ML at FSL (EL 166.5). This volume can be emptied into Lake Wivenhoe within 12 hours and this water can affect the level in Wivenhoe Dam by up to 300mm when Wivenhoe Dam is close to FSL. Operation of the power station and release of water from Splityard Creek Dam to Lake Wivenhoe is outside the control of Seqwater, but should be considered when assessing the various trigger levels of Wivenhoe Dam.

8.2 Flood Release Infrastructure

Radial Gates and an Auxiliary Spillway are the primary infrastructure used to release water during flood events at Wivenhoe Dam. The arrangement of the Radial Gates is shown in the diagram below:



D974

In addition to the five radial gates, the auxiliary spillway was constructed in 2005 as part of an upgrade to improve flood adequacy of this storage. The auxiliary spillway consists of a three bay fuse plug spillway at the right abutment. In association with other works constructed at the dam, this gives the dam crest flood an AEP of approximately 1 in 100,000. Another one bay fuse plug spillway may be constructed at Saddle Dam Two in the future.

Pertinent information about the auxiliary spillway, including the initiation level for the specific bays is given in the following table.

AUXILIARY SPILLWAY - FUSE PLUG DETAILS

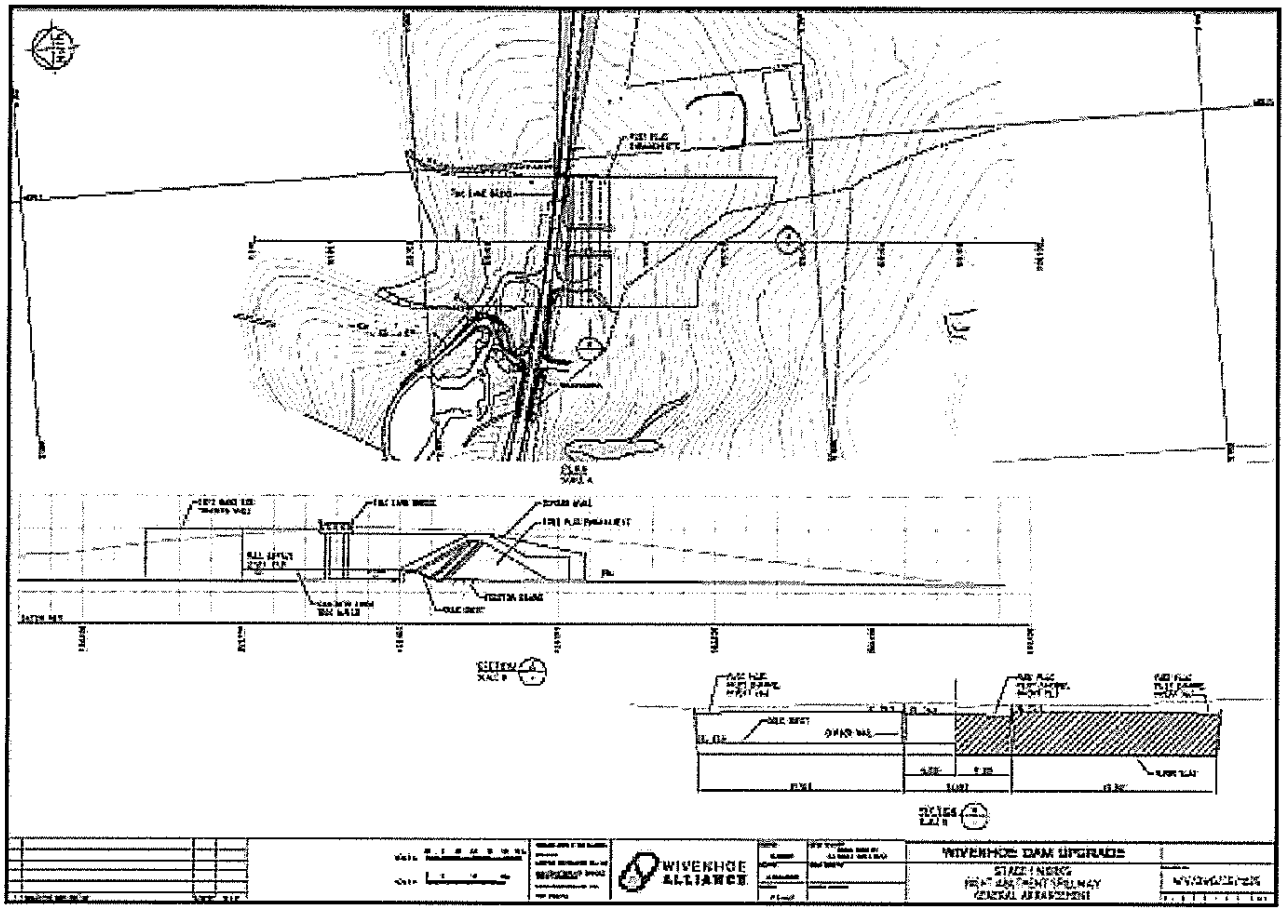
Auxiliary Spillway Component	Spillway Type	Spillway Width	Spillway Crest Level	Fuse Plug Pilot Channel Invert Level	Storage Level corresponding to Fuse Plug Pilot Channel Invert Level*
		m	m AHD	m AHD	m AHD
Central Bay	Ogee	34.0	67	75.7	75.7
Right Side Bay	Ogee	64.5	67	76.2	76.23+
Left Side Bay	Ogee	65.5	67	76.7	76.78++

* Storage Level is as per that measured at the Headwater Gauge. Initiation of Fuse Plug is expected to occur when the Lake Water Level exceeds the Lake Level at Fuse Plug Pilot Channel by 0.10 - 0.15 m.

\+ Includes 0.03m of drawdown from the Fuse Plug Pilot Channel Invert to the Lake Water Level

++ Includes 0.08m of drawdown from the Fuse Plug Pilot Channel Invert to the Lake Water Level

The arrangement of the Auxiliary Spillway is shown in the diagram below.



8.3 Initial Flood Control Action

Once a Flood Event is declared, an assessment is to be made of the magnitude of the Flood Event, including:

- A prediction of the maximum storage levels in Wivenhoe and Somerset Dams.
- A prediction of the peak flow rate at the Lowood Gauge excluding Wivenhoe Dam releases.
- A prediction of the peak flow rate at the Moggill Gauge excluding Wivenhoe Dam releases.

The spillway gates are not to be opened for flood control purposes prior to the reservoir level exceeding EL 67.25.

D976

8.4 Flood Operations Strategies

There are four strategies (W1 to W4) used when operating Wivenhoe Dam during a flood event as outlined below. These strategies are based on the Flood Objectives of this manual. As outlined in Section 3, the objectives, listed in descending order of importance, are as follows:

- Ensure the structural safety of the dams;
- Provide optimum protection of urbanised areas from inundation;
- Minimise disruption to rural life in the valleys of the Brisbane and Stanley Rivers;
- Retain the storage at Full Supply Level at the conclusion of the Flood Event.
- Minimise impacts to riparian flora and fauna during the drain down phase of the Flood Event.

Within any strategy, consideration is always given to these objectives in this order, when making decisions on dam releases.

The strategy chosen at any point in time will depend on the actual levels in the dams and the following predictions, which are to be made using the best forecast rainfall and stream flow information available at the time:

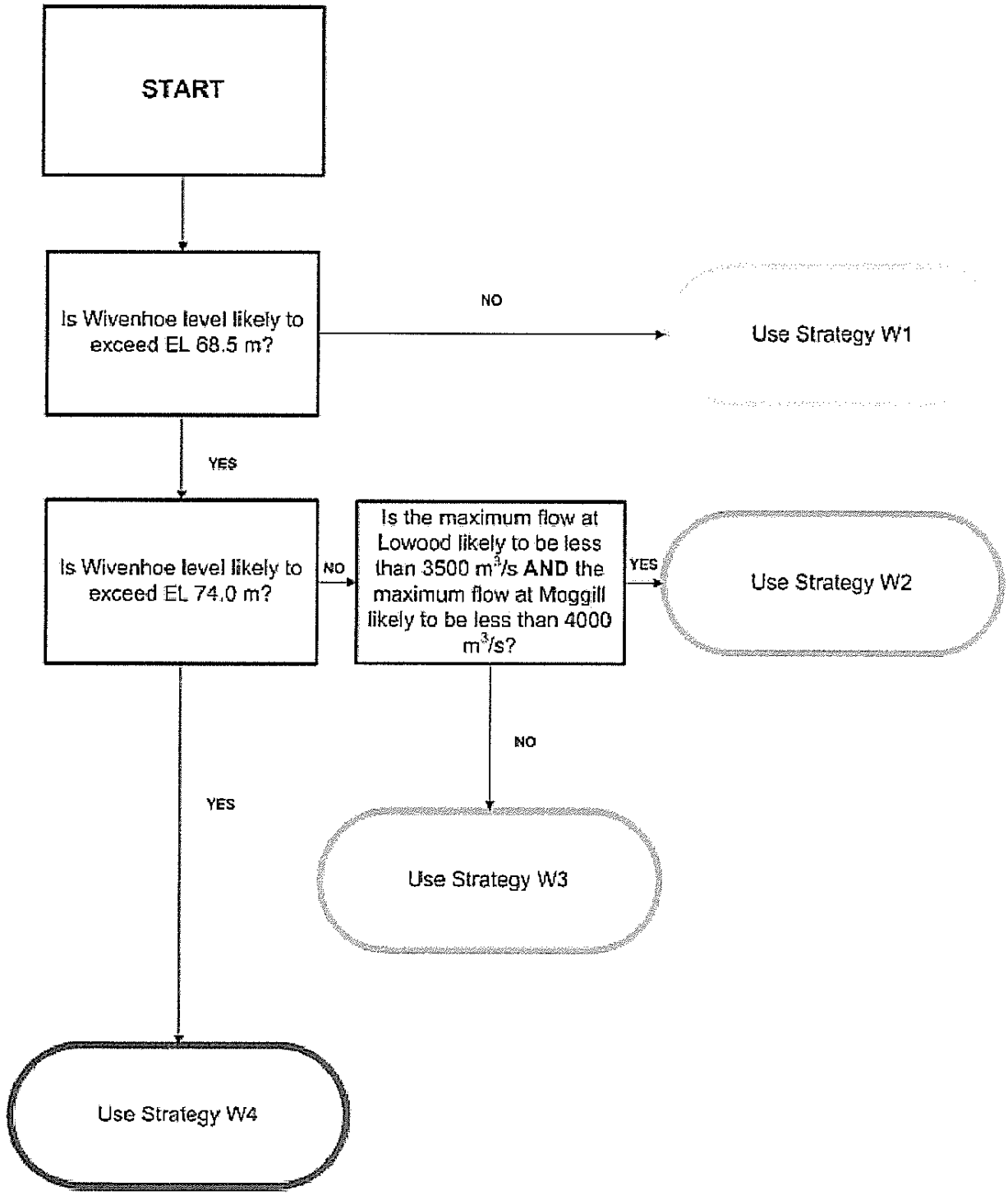
- Maximum storage levels in Wivenhoe and Somerset Dams.
- Peak flow rate at the Lowood Gauge (excluding Wivenhoe Dam releases).
- Peak flow rate at the Moggill Gauge (excluding Wivenhoe Dam releases).

Strategies are likely to change during a flood event as forecasts change and rain is received in the catchments. It is not possible to predict the range of strategies that will be used during the course of a flood event at the commencement of the event. Strategies are changed in response to changing rainfall forecasts and stream flow conditions to maximise the flood mitigation benefits of the dams.

When determining dam outflows within all strategies, peak outflow should generally not exceed peak inflow. A flowchart showing how best to select the appropriate strategy to use at any point in time is shown below:

D977

WIVENHOE FLOOD STRATEGY FLOW CHART

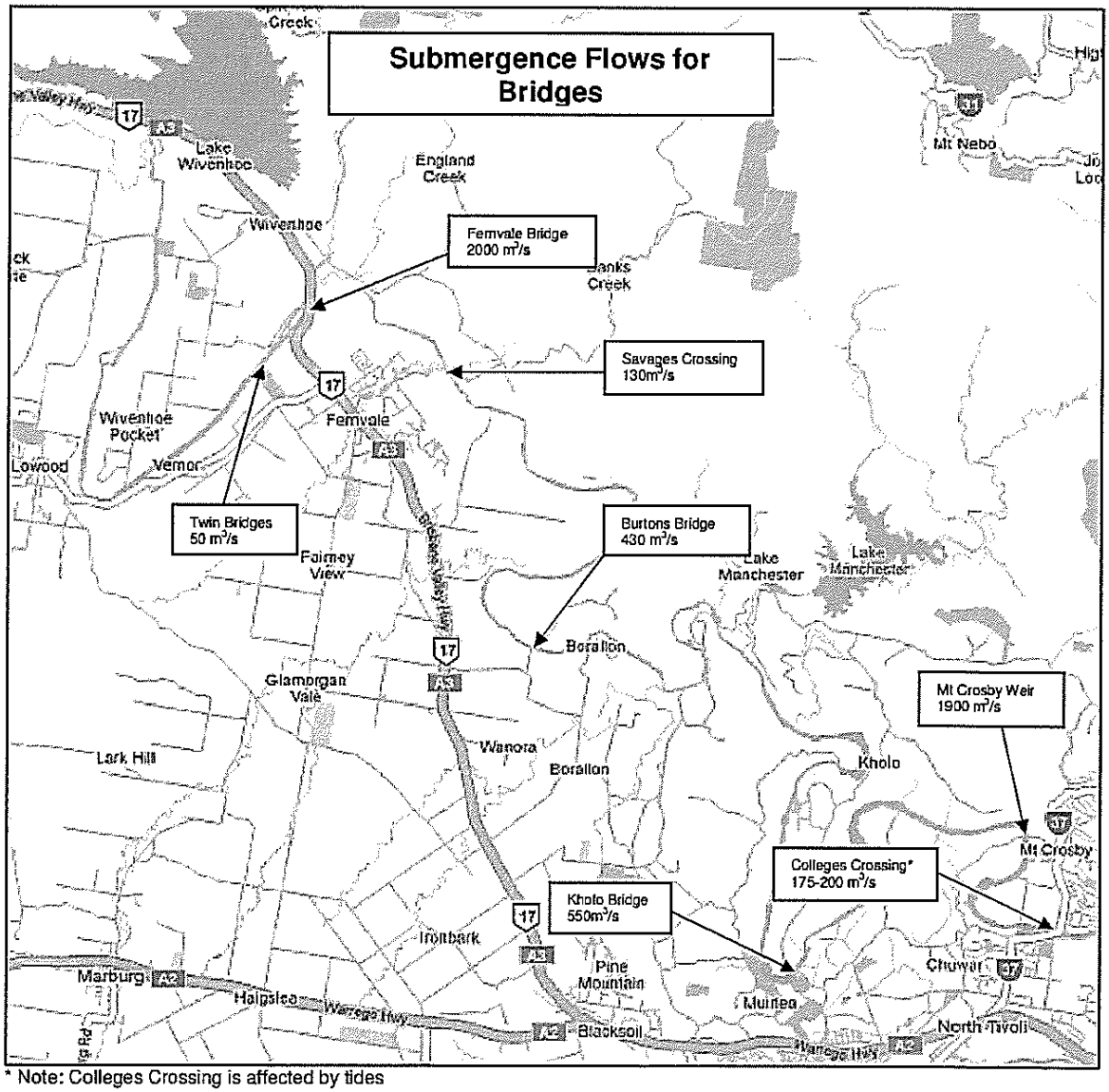


D978

Strategy W1 - The Primary Consideration is Minimising Disruption to Downstream Rural Life

Conditions	• **Wivenhoe Storage Level predicted to be less than 68.50 m AHD** • **Maximum release predicted to be less than 1,900 m^3/s** • **The primary consideration is minimising disruption to downstream rural life**

The intent of Strategy W1 is to not to submerge the bridges downstream of the dam prematurely (see Appendix I). The limiting condition for Strategy W1 is the submergence of Mt Crosby Weir Bridge that occurs at approximately 1,900 m^3/s.



* Note: Colleges Crossing is affected by tides

D979

For situations where flood rains are occurring on the catchment upstream of Wivenhoe Dam and only minor rainfall is occurring downstream of the dam, releases are to be regulated to limit, as much as appropriate in the circumstances, downstream flooding.

The following strategies require a great deal of control over releases and knowledge of discharges from Lockyer Creek. In general, the releases from Wivenhoe Dam are controlled such that the combined flow from Lockyer Creek and Wivenhoe Dam is less than the limiting values to delay the submergence of particular bridges. The diagram above shows the location of the impacted bridges and the approximate river flow rate at which they are closed to traffic.

Strategy W1A Twin Bridges, Savages Crossing and Colleges Crossing

Lake Level greater than 67.25 m AHD
[Maximum Release 110 m^3/s]

Firstly, endeavour to maintain Twin Bridges trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 50 m^3/s.

Once Twin Bridges is closed to traffic, endeavour to maintain Savages Crossing trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 110 m^3/s.

Once Savages Crossing is closed to traffic, endeavour to maintain College's Crossing trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 175 m^3/s. Note that College's Crossing can be impacted by tidal influences.

When the flood event subsides, all gates are to be closed when the dam achieves FSL in accordance with Section 8.5.

Strategy W1B College's Crossing and Burtons Bridge

Lake Level greater than 67.50 m AHD
[Maximum Release 380 m^3/s]

No consideration is given to maintaining Twin Bridges or Savages Crossing open.

Endeavour to maintain College's Crossing trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 175 m^3/s.

Once College's Crossing is closed to traffic, endeavour to maintain Burtons Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 430 m^3/s.

D980

Strategy W1C Burtons Bridge and Kholo Bridge

Lake Level greater than 67.75 m AHD
[Maximum Release 500 m^3/s]

No consideration is given to maintaining College's Crossing open.

Endeavour to maintain Burtons Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 430 m^3/s.

Once Burtons Bridge is closed to traffic, endeavour to maintain Kholo Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 550 m^3/s.

Strategy W1D Kholo Bridge and Mt Crosby Weir Bridge

Lake Level greater than 68.00 m AHD
[Maximum Release 1900 m^3/s]

No consideration is given to maintaining Burtons Bridge open.

Endeavour to maintain Kholo Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 550 m^3/s.

Once Kholo Bridge is closed to traffic, endeavour to maintain Mt Crosby Weir Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 1900 m^3/s.

Strategy W1E Mt Crosby Weir Bridge and Fernvale Bridge

Lake Level greater than 68.25 m AHD
[Maximum Release 1900 m^3/s]

No consideration is given to maintaining Kholo Bridge open.

Endeavour to maintain Mt Crosby Weir Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 1900 m^3/s.

Once Mt Crosby Weir Bridge is closed to traffic, endeavour to maintain Fernvale Bridge trafficable by limiting the combined flows from Wivenhoe Dam and Lockyer Creek to a maximum of 2000 m^3/s.

If the level reaches EL 68.5 m AHD in Wivenhoe Dam, switch to Strategy W2 or W3 as appropriate.

Strategy W2 - Strategy W2 is a Transition Strategy where the primary consideration changes from Minimising Impact to Downstream Rural Life to Protecting Urban Areas from Inundation.

Conditions	• **Wivenhoe Storage Level predicted to be between 68.50 and 74.00 m AHD** • **Maximum Release predicted to be less than 3,500 m^3/s** • **This is a transition strategy in which the primary consideration changes from minimising disruption to downstream rural life to protecting urban areas from inundation** • **Lower level objectives are still considered when making decisions on water releases. Objectives are always considered in order of importance**

The intent of Strategy W2 is limit the flow in the Brisbane River to less than the naturally occurring peaks at Lowood and Moggill, while remaining within the upper limit of non-damaging floods at Lowood (3,500 m^3/s). In these instances, the combined peak river flows should not exceed those shown in the following table:

LOCATION	TARGET MAXIMUM FLOW IN THE BRISBANE RIVER
Lowood	The lesser of: • the natural peak flow at Lowood excluding Wivenhoe Dam releases, and; • 3,500m^3/s.
Moggill	The lesser of: • the natural peak flow at Moggill excluding Wivenhoe Dam releases, and; • 4,000m^3/s.

D982

Strategy W3 – The primary consideration is Protecting Urban Areas from Inundation

Conditions	• **Wivenhoe Storage Level predicted to be between 68.50 and 74.00 m AHD** • **Maximum Release should not exceed 4,000 m^3/s** • **The primary consideration is protecting urban areas from inundation** • **Lower level objectives are still considered when making decisions on water releases. Objectives are always considered in order of importance**

The intent of Strategy W3 is to limit the flow in the Brisbane River at Moggill to less than 4000 m^3/s, noting that 4000 m^3/s at Moggill is the npper limit of non-damaging floods downstream. The combined peak river flow targets for Strategy W3 are shown in the following table. In relation to these targets, it should be noted that depending on natural flows from the Lockyer and Bremer catchments, it may not be possible to limit the flow at Moggill to below 4000 m^3/s. In these instances, the flow at Moggill is to be kept as low as possible.

TIMING	TARGET MAXIMUM FLOW IN THE BRISBANE RIVER
Prior to the naturally occurring peak at Moggill (excluding Wivenhoe Dam releases).	The flow at Moggill is to be minimised.
After the naturally occurring peak at Moggill (excluding Wivenhoe Dam releases).	The flow at Moggill is to be lowered to 4,000m^3/s as soon as possible.

D983

Strategy W4 – The primary consideration is Protecting the Structural Safety of the Dam

Conditions	• **Wivenhoe Storage Level predicted to exceed 74.00m AHD.** • **No limit on Maximum Release rate** • **The primary consideration is protecting the structural safety of the dam** • **Lower level objectives are still considered when making decisions on water releases. Objectives are always considered in order of importance**

The intent of Strategy W4 is to ensure the safety of the dam while limiting downstream impacts as much as possible.

This strategy normally comes into effect when the water level in Wivenhoe Dam reaches 74.0 m AHD. However the Senior Flood Operations Engineer may seek to invoke the discretionary powers of Section 2.8 if earlier commencement is able to prevent triggering of a fuse plug.

Under Strategy W4 the release rate is increased as the safety of the dam becomes the priority. Opening of the gates is to occur generally in accordance with the requirements of Section 8.6, until the storage level of Wivenhoe Dam begins to fall.

There are no restrictions on gate opening increments or gate operating frequency once the storage level exceeds 74.0 AHD, as the safety of the dam is of primary concern at these storage levels. However the impact of rapidly increasing discharge from Wivenhoe Dam on downstream reaches should be considered when determining gate opening sequences.

Strategy W4A – No Fuse Plug Initiation Expected

Lake Level between 74.0 and 75.5 m AHD
[No Maximum Release]

Strategy 4A applies while all indications of the peak flood level in Wivenhoe Dam are that it will be insufficient to trigger operation of the first bay of the fuse plug by reaching 75.5 m AHD.

Gate openings are generally to occur at the minimum intervals and sequences as specified in Section 8.6 until the storage level of Wivenhoe Dam begins to fall. However, to protect the safety of the dam, minimum opening intervals can be reduced and gate opening sequences can be modified.

D984

Strategy W4B – Fuse Plug Initiation Possible

Lake Level greater than 75.5 m AHD
[No Maximum Release]

Strategy W4B applies once indications are the peak flood level in Wivenhoe Dam may exceed EL75.5 and trigger the fuse plug under normal operations. Two scenarios are possible under this strategy. The first scenario is where it may be possible to prevent fuse plug initiation by early opening of the gates. The second scenario is where fuse plug initiation cannot be avoided. The actions associated with these scenarios are contained in the following table:

SCENARIO	ACTION
Potential to keep lake level below EL 75.5 by early opening of the gates and/or varying the operational procedures at Somerset.	The following actions can be used to prevent initiation of the fuse plug provided the safety of the dams is not compromised: • Retain water in Somerset Dam (See Somerset Dam Strategy S3 for guidelines). • Bring the gate operation sequence forward to increase discharge from the dam. In addition to dam safety issues, the impact of rapidly increasing discharge from Wivenhoe Dam on downstream reaches should be considered when determining the rate of gate openings.
Fuse plug initiation cannot be avoided.	PRIOR TO FUSE PLUG INITIATION If possible, the gates are to be raised at a rate to ensure they are out of the water before the initiation of the first fuse plug. The gates should be in the fully open position before the dam water level reaches 75.7 m AHD. FOLLOWING FUSE PLUG INITIATION The impact of rapidly changing discharge from Wivenhoe Dam on downstream reaches should be considered when determining the rate of gate closings in these circumstances. However, once a fuse plug is initiated, the flood storage at the dam is to be drained as quickly as possible within the gate closure sequence.

D985

8.5 Gate Closing Strategies

In general, gate closing commences when the level in Wivenhoe Dam begins to fall and is generally to occur in the reverse order to opening. The final gate closure should occur when the lake level has returned to Full Supply Level. The following requirements must be considered when determining gate closure sequences:

- Where possible, total releases during closure should not produce greater flood levels downstream than occurred during the flood event.
- The maximum discharge from the dam during closure should generally be less than the peak inflow into Wivenhoe Dam experienced during the event. The discharge from Wivenhoe Dam includes discharge from triggered fuse plugs, gates, regulator cone dispersion valve and hydro release.
- If, at the time the lake level in Wivenhoe Dam begins to fall, the combined flow at Lowood is in excess of 3,500 m^3/s then the combined flow at Lowood is to be reduced to 3,500 m^3/s as quickly as practicable.
- The aim should always be to empty stored floodwaters stored above EL 67.0m within seven days after the flood peak has passed through the dams. However, provided a favourable weather outlook is available, this requirement can be relaxed for the volume between EL 67.0m and EL 67.5m, to obtain positive environmental outcomes.
- If the flood storage compartments of Wivenhoe Dam and Somerset Dam can be emptied within seven days, the maximum flow in the Brisbane River at Lowood should not exceed 3,500 m^3/s.
- To minimise the stranding of fish downstream of the dam, final closure sequences should consider Seqwater policies relating to fish protection at the dam.

There may be a need to take into account base flow when determining final gate closure. This may mean that the lake level temporarily falls below Full Supply Level to provide for a full dam at the end of the Flood Event.

8.6 Gate Operation Sequences

Radial Gate Opening Operations

When dam outflows are less than 4,000 m^3/s, rapid opening of the radial gates can cause undesirable rapid rises in downstream river levels. Accordingly, when dam outflows are less than 4,000 m^3/s, the aim in opening radial gates is to operate the gates one at a time at intervals that will minimise adverse impacts on the river system. The table below shows the target minimum interval for gate operations in these circumstances. This target interval can be reduced if the gates are at risk of being overtopped or the safety of the dam is at risk.

D986

TARGET MINIMUM INTERVAL FOR RADIAL GATE OPENING (DOWNSTREAM RIVER FLOWS < 4000 m^3/s)

OPERATION	TIME INTERVAL BETWEEN SUCCESSIVE OPENING OF INDIVIDUAL GATES (mins)
Radial Gate opening of 500 mm	10

When dam outflows exceed 4,000 m^3/s, the impact of rapid gate openings on downstream water levels is reduced due to the already elevated river levels. Under these circumstances, the safety of the dam will generally be of primary concern and therefore there are no minimum gate opening intervals in these circumstances.

Under extreme circumstances, the mechanical capability of the radial gate operating system provides the facility to open each radial gate more than five metres within a one hour period. Accordingly, unless a mechanical breakdown is experienced, physical gate opening capability in unlikely to be a constraint in meeting projected outflow targets.

Radial Gate Closing Operations

When dam outflows are less than 4,000 m^3/s, rapid closure of the radial gates can cause adverse impacts to the river system. Accordingly, when dam outflows are less than 4,000 m^3/s, the aim in closing radial gates is to operate the gates one at a time at an interval that will minimise adverse impacts on the river system as outlined in the table below.

TARGET MINIMUM INTERVAL FOR RADIAL GATE CLOSURE

OPERATION	TIME INTERVAL BETWEEN SUCCESSIVE CLOSING OF INDIVIDUAL GATES (mins)
Radial Gate closure of 500 mm	20

When dam outflows exceed 4,000 m^3/s, the impact of rapid gate closings is reduced due to the already elevated river levels. However, given that the safety of the dam is unlikely to be at risk if decisions are made to close radial gates, the target of operating the gates one at a time in accordance with the time interval shown in the above table remains.

Rapid closure of radial gates is permissible however, when there is a requirement to preserve storage or to reduce downstream flooding. When determining gate closure sequences, consideration should also be given to following the calculated natural recession of the flood in the river to aim to ensure that the recession impacts are not greater than those that would have been experienced had the dam not been constructed.

D987

Protection of the Spillway Walls

The flip bucket spillway is designed to control the discharge from the reservoir and to dissipate the energy of the discharge. The flip throws the discharge clear of the concrete spillway structures and into a plunge pool where the energy is dissipated by turbulence. Under non-symmetric flow conditions or when Gates 1 and 5 are not operating, the discharge jet may impinge on the walls of the plunge pool. As these walls have been excavated into erodible sandstone rock, this impingement may cause non-predictable erosion. Upstream migration of this erosion is to be avoided. This can be achieved by operating Gates 1 and 5 to deflect the discharge away from the walls of the plunge pool.

Therefore in operating the spillway, the principles to be observed in order of priority are:

(i) The discharge jet into the plunge pool is not to impinge on the right or left walls of the plunge pool.

(ii) The flow in the spillway is to be symmetrical.

Normal Gate Operation Sequences

Under normal operation, only one gate is to be opened at any one time and the sequences shown in the table below are to be adopted. Generally gates are operated in the order of 3,2,4,1,5. Variations are allowed at any time to protect the structural safety of the dam.

It should also be noted that:

- Gates are numbered 1 to 5 from the left bank looking downstream
- Flow in spillway to be as symmetrical as possible.

RADIAL GATE OPENING SEQUENCES

Gate 1 Opening (m)	Gate 2 Opening (m)	Gate 3 Opening (m)	Gate 4 Opening (m)	Gate 5 Opening (m)	Gate Operated
-	-	-	-	-	-
0.0	0.0	0.0	0.0	0.0	-
0.0	0.0	0.5	0.0	0.0	3
0.0	0.0	1.0	0.0	0.0	3
0.0	0.0	1.5	0.0	0.0	3
0.0	0.0	2.0	0.0	0.0	3
0.0	0.0	2.5	0.0	0.0	3
0.0	0.0	3.0	0.0	0.0	3
0.0	0.0	3.5	0.0	0.0	3
0.0	0.5	3.5	0.0	0.0	2
0.0	0.5	3.5	0.5	0.0	4
0.0	0.5	4.0	0.5	0.0	3
0.0	1.0	4.0	0.5	0.0	2
0.0	1.0	4.0	1.0	0.0	4

D988

Gate 1 Opening (m)	Gate 2 Opening (m)	Gate 3 Opening (m)	Gate 4 Opening (m)	Gate 5 Opening (m)	Gate Operated
0.5	1.0	4.0	1.0	0.0	1
0.5	1.0	4.0	1.0	0.5	5
0.5	1.5	4.0	1.0	0.5	2
0.5	1.5	4.0	1.5	0.5	4
1.0	1.5	4.0	1.5	0.5	1
1.0	1.5	4.0	1.5	1.0	5
1.0	2.0	4.0	1.5	1.0	2
1.0	2.0	4.0	2.0	1.0	4
1.5	2.0	4.0	2.0	1.0	1
1.5	2.0	4.0	2.0	1.5	5
1.5	2.5	4.0	2.0	1.5	2
1.5	2.5	4.0	2.5	1.5	4
1.5	2.5	4.5	2.5	1.5	3
2.0	2.5	4.5	2.5	1.5	1
2.0	2.5	4.5	2.5	2.0	5
2.5	2.5	4.5	2.5	2.0	1
2.5	2.5	4.5	2.5	2.5	5
2.5	3.0	4.5	2.5	2.5	2
2.5	3.0	4.5	3.0	2.5	4
2.5	3.5	4.5	3.0	2.5	2
2.5	3.5	4.5	3.5	2.5	4
3.0	3.5	4.5	3.5	2.5	1
3.0	3.5	4.5	3.5	3.0	5
3.0	4.0	4.5	3.5	3.0	2
3.0	4.0	4.5	4.0	3.0	4
3.0	4.0	5.0	4.0	3.0	3
3.5	4.0	5.0	4.0	3.0	1
3.5	4.0	5.0	4.0	3.5	5
3.5	4.5	5.0	4.0	3.5	2
3.5	4.5	5.0	4.5	3.5	4
4.0	4.5	5.0	4.5	3.5	1
4.0	4.5	5.0	4.5	4.0	5
4.5	4.5	5.0	4.5	4.0	1
4.5	4.5	5.0	4.5	4.5	5
4.5	5.0	5.0	5.0	4.5	2,4
5.0	5.0	5.0	5.0	5.0	1,5
5.0	5.0	5.5	5.0	5.0	3
5.0	5.5	5.5	5.5	5.0	2,4
5.5	5.5	5.5	5.5	5.5	1,5
5.5	5.5	6.0	5.5	5.5	3
5.5	6.0	6.0	6.0	5.5	2,4
6.0	6.0	6.0	6.0	6.0	1,5
6.0	6.0	6.5	6.0	6.0	3
6.0	6.5	6.5	6.5	6.0	2,4
6.5	6.5	6.5	6.5	6.5	1,5
6.5	6.5	7.0	6.5	6.5	3
7.0	7.0	7.0	7.0	7.0	2,4,1,5

D989

Gate 1 Opening (m)	Gate 2 Opening (m)	Gate 3 Opening (m)	Gate 4 Opening (m)	Gate 5 Opening (m)	Gate Operated
7.5	7.5	7.5	7.5	7.5	3,2,4,1,5
8.0	8.0	8.0	8.0	8.0	3,2,4,1,5
8.5	8.5	8.5	8.5	8.5	3,2,4,1,5
9.0	9.0	9.0	9.0	9.0	3,2,4,1,5
9.5	9.5	9.5	9.5	9.5	3,2,4,1,5
10.0	10.0	10.0	10.0	10.0	3,2,4,1,5
11.0	11.0	11.0	11.0	11.0	3,2,4,1,5
12.0	12.0	12.0	12.0	12.0	3,2,4,1,5
13.0	13.0	13.0	13.0	13.0	3,2,4,1,5
14.0	14.0	14.0	14.0	14.0	3,2,4,1,5
15.0	15.0	15.0	15.0	15.0	3,2,4,1,5
17.5	17.5	17.5	17.5	17.5	3,2,4,1,5

During the initial opening or final closure sequences of gate operations it is permissible to replace the discharge through a gate by the immediate opening of a regulator valve (or the reverse operation). This allows for greater control of low flows.

Gate Failure or Malfunction Procedures

Gate operating procedures in the event of equipment failure are contained in Appendix G. If one or more gates are inoperable during the course of the flood event, the gate openings of the remaining gates are to be adjusted to provide the required discharge from the dam. These adjustments should ensure that:

- The impact of the flow on the sidewalls of the plunge pool should be minimised, and
- The flow in the spillway is as symmetrical as practicable.

Radial Gate Turbulence Considerations

Unless in the process of lifting the gates clear of the flow, the bottom edge of the radial gates must always be at least 500 millimetres below the release flow surface. Having the bottom edge of the gates closer to the release flow surface than 500 millimetres may cause unusual turbulence that could adversely impact on the gates. This procedure has never been undertaken in practice and should be observed closely when being undertaken. Variations to the procedure are allowed to protect the structural safety of the dam.

Lowering Radial Gates that have been lifted Clear of the Release Flow

When lowering radial gates that have been lifted clear of the release flow, the bottom edge of the gates must be lowered at least 500 millimetres into the flow. Lowering gates into the release flow less than this amount may cause unusual turbulence that could adversely impact on the gates. This procedure has never been undertaken in practice and should be observed closely

D990

when being undertaken. Variations to the procedure are allowed to protect the structural safety of the dam.

8.7 Modification to Flood Operating Procedures if a Fuse Plug Triggers

Where the operation of a fuse plug spillway bay has been triggered, the flood operation procedures are to be modified such that:

- The discharge from the triggered fuse plug is to be taken into account when determining total flood releases from the dam;
- The gates are to be operated, to the extent possible, so that the same discharge restrictions apply as would have if the fuse plug embankment was intact.

8.8 Modification to Flood Operating Procedures if a subsequent flood event occurs prior to the reconstruction of Triggered Fuse Plugs

Where the operation of any or all of the fuse plug spillway bays has been triggered and a flood event occurs before the fuse plug can be reinstated, the flood operation procedures are to be modified such that:

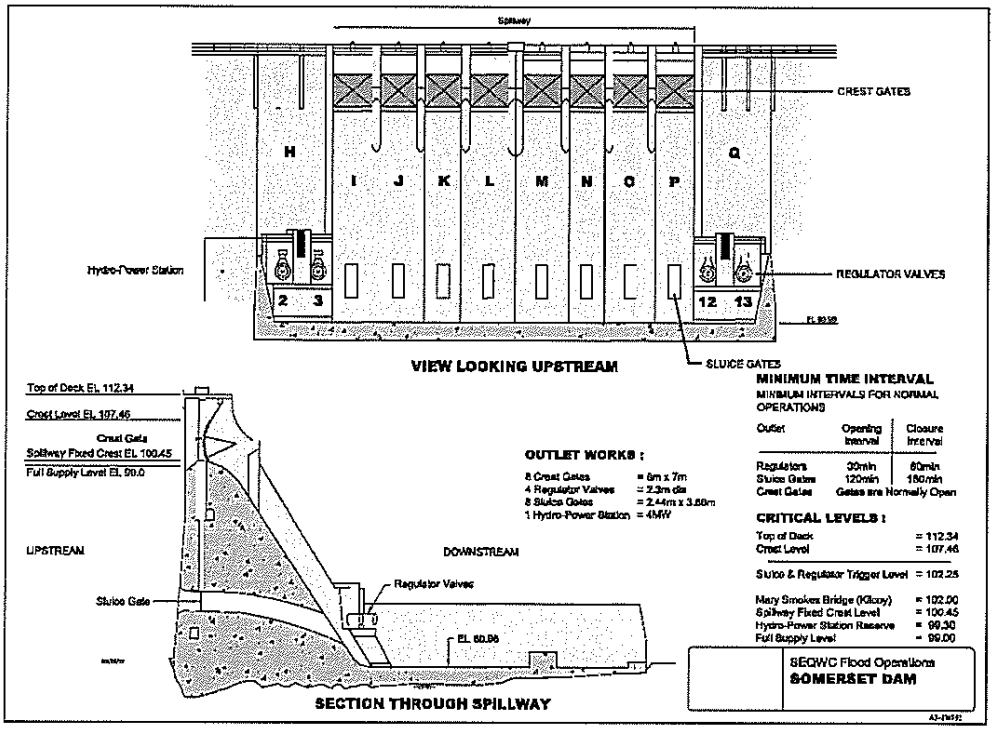
- The discharge from the triggered fuse plug is to be taken into account when determining total flood releases from the dam;
- The gates are to be operated, to the extent possible, so that the same discharge restrictions apply as would have if the fuse plug embankment was intact.
- Discharge from the Auxiliary Spillway will occur before the Gate Trigger Level of EL 67.25 m AHD. This flow should be taken into account when applying the flood operation strategies relevant to the low level bridge crossings.

D991

9 SOMERSET DAM FLOOD OPERATIONS

9.1 Introduction

Somerset Dam is capable of being operated in a number of ways to regulate Stanley River floods. Somerset Dam and Wivenhoe Dam are to be operated in conjunction to optimise the flood mitigation benefits downstream of Wivenhoe Dam. The arrangement of the Somerset Dam Radial Gates, Sluice Gates and Regulator Valves is shown in the diagram below. At EL 107.45, flood waters commence to flow over the dam crest. To account for this discharge, the dam crest is assumed to operate as a broad crested weir with a spillway width of 135.33 m:



9.2 Initial Flood Control Action

Once a Flood Event is declared, all radial gates are to be fully opened and all sluice gates and regulator valves are to be fully closed. An assessment is to be made of the magnitude of the Flood Event, including a prediction of the maximum storage levels in Wivenhoe and Somerset Dams.

9.3 Flood Operations Strategies

There are three strategies used when operating Somerset Dam during a flood event as outlined below. These strategies are based on the Flood Objectives of this manual. The strategy chosen at any point in time will depend on predictions of the maximum storage levels in Wivenhoe and Somerset Dams which are to be made using the best forecast rainfall and stream flow information available at the time.

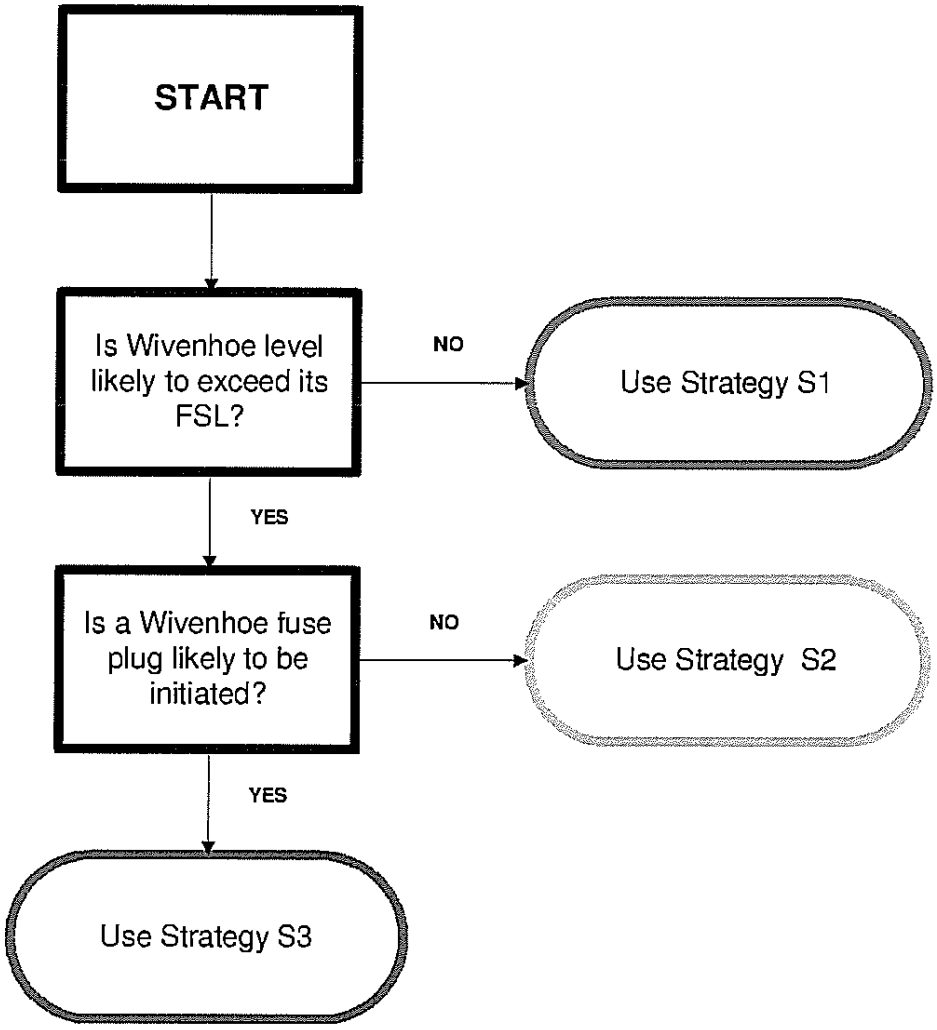
D992

Strategies are likely to change during a flood event as forecasts change and rain is received in the catchments. It is not possible to predict the range of strategies that will be used during the course of a flood event at the commencement of the event. Strategies are changed in response to changing rainfall forecasts and stream flow conditions to maximise the flood mitigation benefits of the dams.

When calculating the impacts of flood releases from Somerset Dam, the gate opening sequences outlined in Section 9.5 should be used to determine likely outflow rates from the dam.

A flowchart showing how best to select the appropriate strategy to use at any point in time is shown below:

SOMERSET FLOOD STRATEGY FLOW CHART



The order of operation for opening the sluices under each strategy is LMKNJOIP. Sluices are to be closed in reverse order of opening. Any inoperable sluices are to be dropped from the opening or closing sequences.

D993

Strategy S1 – Minimising Impact on Rural Life Upstream

Conditions	• **Somerset Dam Level expected to exceed EL 99.0 and Wivenhoe Dam not expected to reach EL 67.0 (FSL) during the course of the Flood Event**

The intent of this strategy is to return the dam to full supply level while minimising the impact on rural life upstream of the dam. Consideration is also given to minimising the downstream environmental impacts from the release.

The crest gates at Somerset Dam are raised to enable uncontrolled discharge. The Regulator Valves and Sluice gates are to be used to maintain the level in Somerset dam below EL 102.0 (deck level of Mary Smokes Bridge). The release rate from Somerset dam is not to exceed the peak inflow into the dam.

Strategy S2 – Minimise Impacts below Wivenhoe Dam

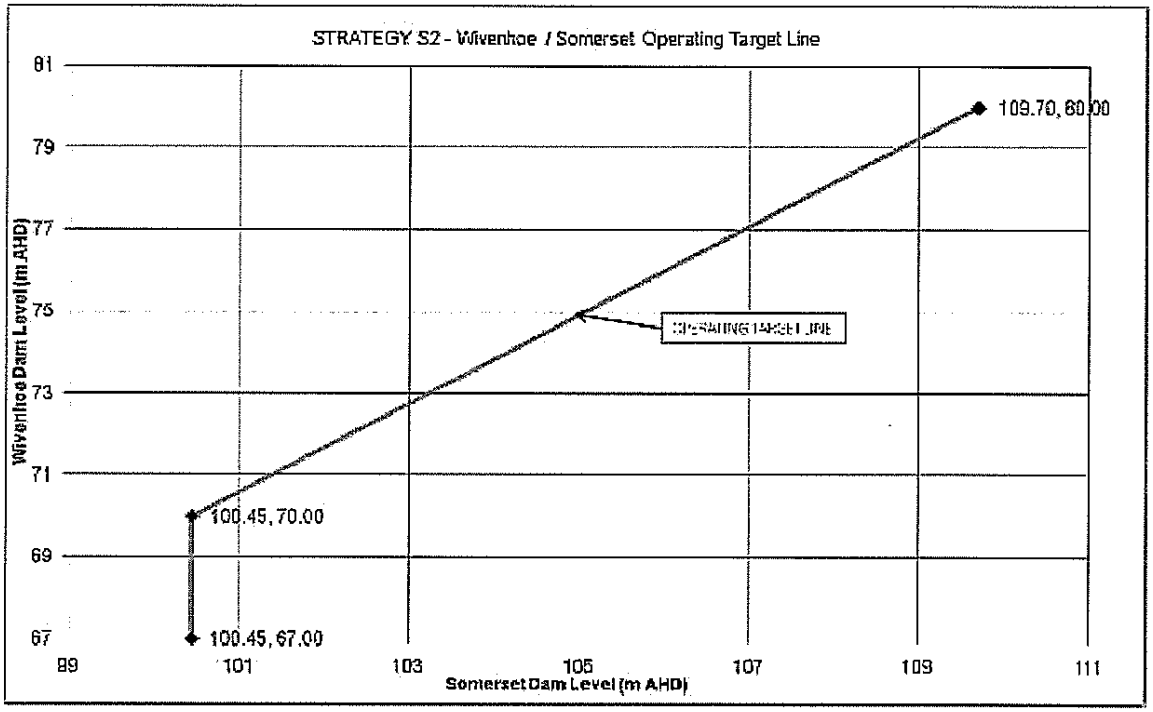
Conditions	• **Somerset Dam Level expected to exceed EL 99.0 and Wivenhoe Dam level expected to exceed EL 67.0 (FSL) but not exceed EL 75.5 (fuse plug initiation) during the course of the Flood Event.**

The intent of this strategy is to maximise the benefits of the flood storage capabilities of the dam while protecting the structural safety of both dams. The table below contains the operating conditions and actions for Strategy S2.

CONDITION	ACTION
Wivenhoe rising and Somerset level below EL 100.45.	The crest gates are raised to enable uncontrolled discharge. The low level regulators and sluices are generally kept closed.
Wivenhoe rising and Somerset level above EL 100.45.	The crest gates are raised to enable uncontrolled discharge. Operations are to target a correlation of water levels in Somerset Dam and Wivenhoe Dam as set out in the graph below. The operations target line shown on this graph is to generally be followed as the flood event progresses. The release rate from Somerset Dam is generally not to exceed the peak inflow into the dam.

D994

Wivenhoe falling and Somerset level above EL 100.45.	The opening of the regulators and sluices generally should not cause Wivenhoe Dam to rise significantly. The release rate from Somerset Dam is generally not to exceed the peak inflow into the dam.
The Flood Event has emanated mainly from the Stanley River catchment without significant runoff in the Upper Brisbane River catchment	The crest gates at Somerset Dam are raised to enable uncontrolled discharge. The Regulator Valves and Sluice gates are to be used to maintain the level in Somerset dam below EL 102.0 (deck level of Mary Smokes Bridge). The release rate from Somerset Dam is generally not to exceed the peak inflow into the dam.



Notes:

- The Operating Target Line was selected following an optimisation study. The Target Line was selected based on the following factors:
    - Equal minimisation of flood level peaks in both dams in relation to their associated dam failure levels.
    - Minimisation of flows in the Brisbane River downstream of Wivenhoe Dam.
    - Consideration of the time needed at the onset of a Flood Event to properly assess the magnitude of the event and the likely impacts, so that the likely optimal strategy to maximise the Flood Mitigation benefits of the storages can be selected.
- The levels of 109.70 m AHD and 80.00 m AHD represent the likely failure level for Somerset Dam and the level at the top of the Wivenhoe Dam Wave Wall respectively. Note that the failure level of 109.70 m AHD for Somerset Dam assumes all radial gates are fully open and this failure level will be reduced if this cannot be achieved.

D995

- The target point on the operating target line at any point in time is based on the maximum storage levels in Wivenhoe and Somerset Dams using the best forecast rainfall and stream flow information available at the time.
- Gate operations will enable the movement of the duty point towards the target line in a progressive manner. It will not necessarily be possible to adjust the duty point directly towards the target line in a single gate operation.

Strategy S3 - Protect the Structural Safety of the Dam

Conditions	• **Somerset Dam Level expected to exceed EL 99.0 and Wivenhoe Dam level expected to exceed EL 75.5 (fuse plug initiation) during the course of the Flood Event.**

The intent of this strategy is to maximise the benefits of the flood storage capabilities of the dam while protecting the structural safety of both dams.

In addition to the operating protocols used in Strategy S2, to prevent fuse plug initiation, consideration can be given to temporary departure from the operating protocols contained in this strategy under the following conditions:

- The safety of Somerset Dam is the primary consideration and cannot be compromised.
- The peak level in Somerset dam cannot exceed EL 109.7.

9.4 Gate Closing Strategies

In general, gate closing commences when the level in Somerset Dam begins to fall and is generally to occur in the reverse order to opening. The final gate closure should occur when the lake level has returned to Full Supply Level. The following requirements must be considered when determining gate closure sequences:

- Unless determined otherwise by the Senior Flood Operations Engineer in accordance with Section 2.8, the aim should be to empty stored floodwaters within seven days after the flood peak has passed through the dams.
- To minimise the stranding of fish downstream of the dam, final closure sequences should consider Seqwater policies relating to fish protection at the dam.

There may be a need to take into account base flow when determining final gate closure. This may mean that the lake level temporarily falls below Full Supply Level to provide for a full dam at the end of the Flood Event.

D996

9.5 Gate Operation Sequences

Intervals between Operations

Releases from Somerset Dam flow directly into Wivenhoe Dam and therefore the downstream river impact considerations associated with radial gate operations at Wivenhoe Dam, do not directly apply to Somerset Dam. However, the following minimum intervals should generally be observed whilst opening and closing regulators, sluices and crest gates at Somerset Dam for flood mitigation purposes. These intervals have been chosen to minimise any adverse impacts caused by lake level rises above the junction of the Stanley and Brisbane Rivers.

MINIMUM INTERVALS FOR NORMAL GATE OPERATIONS

ITEM	OPENING	CLOSING
Regulator Valves	30 mins	60 mins
Sluice Gates (Dam level < EL 100.45)	120 mins	180 mins
Sluice Gates (Dam level > EL 100.45)	60 mins	60 mins
Crest Gates	Gates are normally open	-

Sluice Gate Operations

The order of operation for opening the sluices under each strategy is LMKNJOIP. Sluices are to be closed in reverse order of opening. Any inoperable sluices are to be dropped from the opening or closing sequences.

Regulator Valve Considerations

During the initial opening or final closure sequences of gate operations it is permissible to replace the discharge through a sluice gate by the immediate opening of one or more regulator valves (or the reverse operation). This allows for greater control of low flows and enables a smooth transition on opening and closing sequences.

It must also be noted that the Regulator Valves are not to be operated when the tail water level below Somerset Dam is above the invert of the valves (68.60 m AHD). Operating the valves under these circumstances can damage the valves. This requirement can be ignored if the structural safety of the dam is at risk.

D997

10 EMERGENCY FLOOD OPERATIONS

10.1 Introduction

While every care has been exercised in the design and construction of the dams, there still remains a low risk that the dams may develop an emergency condition either through flood events or other causes. Vigilance is required to recognise emergency flood conditions such as:

- Occurrence of a much larger flood than the discharge capacity of the dam;
- Occurrence of a series of large storms in a short period;
- Failure of one or more gates during a flood.
- Development of a piping failure through the embankment of Wivenhoe Dam;
- Damage to the dams by earthquake;
- Damage to the dams as an act of war or terrorism;

Responses to these conditions are included in Emergency Action Plans for the dams.

10.2 Overtopping of Dams

Whatever the circumstances, every endeavour must be made to prevent overtopping of Wivenhoe Dam by the progressive opening of operative spillway gates. The Auxiliary Spillway constructed at the dam in 2005 gives the dam crest flood an AEP of approximately 1 in 100,000. Another one bay fuse plug spillway may be constructed at Saddle Dam Two in the future, thereby increasing this immunity.

Somerset Dam should not be overtopped by flood water, but if Wivenhoe Dam is threatened by overtopping, the release of water from Somerset Dam is to be reduced at the risk of overtopping Somerset Dam in order to prevent the overtopping of Wivenhoe Dam.

10.3 Communications Failure

If communications are lost between the Flood Operations Centre and either dam, the officers in charge at each dam are to adopt the procedures set out below.

Wivenhoe Dam Emergency Procedure

In the event of communications loss with the Flood Operations Centre, the Dam Supervisor at Wivenhoe Dam is to assume responsibility for flood releases from the Dam. Once it has been established that communications have been lost, the Dam Supervisor at Wivenhoe Dam is to:-

- Take all practicable measures to restore communications and periodically check the lines of communication for any change;

D998

- Follow the procedures set out below to determine the relevant magnitude and duration of releases from Wivenhoe Dam;
- Log all actions in the Event Log;
- Ensure the dam is at full supply level at the end of the event;
- Remain in the general vicinity of the dam while on duty.

The radial gate opening sequence is as set out in Table 10.2. Individual sequence steps are shown against a target storage level. The minimum time intervals between each step in the radial gate opening sequence are shown in Table 10.1. Falling behind or being in front of the target gate openings is permissible when the storage level is less than 74.0 m AHD, but not allowed when the storage level is greater than 74.0 m AHD. When the storage level is below 74.0 m AHD, the operating intervals shown in Table 10.1 must generally be followed and can be ignored only to protect the structural safety of the dam.

Where the operation of a fuse plug spillway bay has been triggered, the relevant table contained in Appendix J is to be substituted for Table 10.2.

TABLE 10.1
MINIMUM INTERVALS BETWEEN OPERATING SEQUENCE STEPS

ITEM	MINIMUM OPENING INTERVAL	MINIMUM CLOSING INTERVAL
Radial Gates (Dam Level < EL 74.0)	10 mins	20 mins
Radial Gates (Dam Level > EL 74.0)	No Minimum	No Minimum

TABLE 10.2
RADIAL GATE OPENING SEQUENCE STEPS AND TARGET GATE OPENINGS AGAINST STORAGE LEVEL

Storage Level	Gate 1 Opening	Gate 2 Opening	Gate 3 Opening	Gate 4 Opening	Gate 5 Opening	Total Opening	Discharge	Gate Operated
m AHD	(m)	(m)	(m)	(m)	(m)	(m)	(m^3/s)	
67.00	-	-	-	-	-	-		
67.25	0.0	0.0	0.0	0.0	0.0	0	0	
67.50	0.0	0.0	0.5	0.0	0.0	0.5	50	3
67.75	0.0	0.0	1.0	0.0	0.0	1.0	100	3
68.00	0.0	0.0	1.5	0.0	0.0	1.5	150	3
68.25	0.0	0.0	2.0	0.0	0.0	2.0	210	3
68.50	0.0	0.0	2.5	0.0	0.0	2.5	260	3
68.65	0.0	0.0	3.0	0.0	0.0	3.0	310	3

D999

TABLE 10.2 (CONTINUED)

Storage Level	Gate 1 Opening	Gate 2 Opening	Gate 3 Opening	Gate 4 Opening	Gate 5 Opening	Total Opening	Discharge	Gate Operated
m AHD	(m)	(m)	(m)	(m)	(m)	(m)	(m^3/s)	
68.80	0.0	0.0	3.5	0.0	0.0	3.5	360	3
68.95	0.0	0.5	3.5	0.0	0.0	4.0	430	2
69.10	0.0	0.5	3.5	0.5	0.0	4.5	470	4
69.25	0.0	0.5	4.0	0.5	0.0	5.0	520	3
69.40	0.0	1.0	4.0	0.5	0.0	5.5	570	2
69.55	0.0	1.0	4.0	1.0	0.0	6.0	640	4
69.70	0.5	1.0	4.0	1.0	0.0	6.5	700	1
69.85	0.5	1.0	4.0	1.0	0.5	7.0	760	5
70.00	0.5	1.5	4.0	1.0	0.5	7.5	820	2
70.15	0.5	1.5	4.0	1.5	0.5	8.0	880	4
70.30	1.0	1.5	4.0	1.5	0.5	8.5	940	1
70.45	1.0	1.5	4.0	1.5	1.0	9.0	1,000	5
70.60	1.0	2.0	4.0	1.5	1.0	9.5	1,070	2
70.70	1.0	2.0	4.0	2.0	1.0	10.0	1,130	4
70.80	1.5	2.0	4.0	2.0	1.0	10.5	1,190	1
70.90	1.5	2.0	4.0	2.0	1.5	11.0	1,250	5
71.00	1.5	2.5	4.0	2.0	1.5	11.5	1,310	2
71.10	1.5	2.5	4.0	2.5	1.5	12.0	1,370	4
71.20	1.5	2.5	4.5	2.5	1.5	12.5	1,430	3
71.30	2.0	2.5	4.5	2.5	1.5	13.0	1,500	1
71.40	2.0	2.5	4.5	2.5	2.0	13.5	1,560	5
71.50	2.5	2.5	4.5	2.5	2.0	14.0	1,620	1
71.60	2.5	2.5	4.5	2.5	2.5	14.5	1,680	5
71.70	2.5	3.0	4.5	2.5	2.5	15.0	1,750	2
71.80	2.5	3.0	4.5	3.0	2.5	15.5	1,810	4
71.90	2.5	3.5	4.5	3.0	2.5	16.0	1,870	2
72.00	2.5	3.5	4.5	3.5	2.5	16.5	1,930	4
72.10	3.0	3.5	4.5	3.5	2.5	17.0	2,000	1
72.20	3.0	3.5	4.5	3.5	3.0	17.5	2,060	5
72.30	3.0	4.0	4.5	3.5	3.0	18.0	2,130	2
72.40	3.0	4.0	4.5	4.0	3.0	18.5	2,190	4
72.50	3.0	4.0	5.0	4.0	3.0	19.0	2,250	3
72.55	3.5	4.0	5.0	4.0	3.0	19.5	2,310	1
72.60	3.5	4.0	5.0	4.0	3.5	20.0	2,370	5
72.65	3.5	4.5	5.0	4.0	3.5	20.5	2,430	2
72.70	3.5	4.5	5.0	4.5	3.5	21.0	2,490	4
72.75	4.0	4.5	5.0	4.5	3.5	21.5	2,550	1
72.80	4.0	4.5	5.0	4.5	4.0	22.0	2610	5
72.85	4.5	4.5	5.0	4.5	4.0	22.5	2670	1
72.90	4.5	4.5	5.0	4.5	4.5	23.0	2740	5
72.95	4.5	5.0	5.0	5.0	4.5	24.0	2850	2,4
73.00	5.0	5.0	5.0	5.0	5.0	25.0	2970	1,5
73.10	5.0	5.0	5.5	5.0	5.0	25.5	3030	3
73.20	5.0	5.5	5.5	5.5	5.0	26.5	3130	2,4

D1000

TABLE 10.2 (CONTINUED)

Storage Level	Gate 1 Opening	Gate 2 Opening	Gate 3 Opening	Gate 4 Opening	Gate 5 Opening	Total Opening	Discharge	Gate Operated
m AHD	(m)	(m)	(m)	(m)	(m)	(m)	(m^3/s)	
73.30	5.5	5.5	5.5	5.5	5.5	27.5	3280	1,5
73.40	5.5	5.5	6.0	5.5	5.5	28.0	3340	3
73.50	5.5	6.0	6.0	6.0	5.5	29.0	3460	2,4
73.60	6.0	6.0	6.0	6.0	6.0	30.0	3590	1,5
73.70	6.0	6.0	6.5	6.0	6.0	30.5	3680	3
73.80	6.0	6.5	6.5	6.5	6.0	31.5	3780	2,4
73.90	6.5	6.5	6.5	6.5	6.5	32.5	3900	1,5
74.00	6.5	6.5	7.0	6.5	6.5	33.0	3970	3
74.10	7.0	7.0	7.0	7.0	7.0	35.0	4210	1,2,4,5
74.20	7.5	7.5	7.5	7.5	7.5	37.5	4510	1,2,3,4,5
74.30	8.0	8.0	8.0	8.0	8.0	40.0	4810	1,2,3,4,5
74.40	8.5	8.5	8.5	8.5	8.5	42.5	5110	1,2,3,4,5
74.50	9.0	9.0	9.0	9.0	9.0	45.0	5430	1,2,3,4,5
74.60	9.5	9.5	9.5	9.5	9.5	47.5	5750	1,2,3,4,5
74.70	10.0	10.0	10.0	10.0	10.0	50.0	6070	1,2,3,4,5
74.80	11.0	11.0	11.0	11.0	11.0	55.0	6740	1,2,3,4,5
74.90	12.0	12.0	12.0	12.0	12.0	60.0	7440	1,2,3,4,5
75.00	13.0	13.0	13.0	13.0	13.0	65.0	8200	1,2,3,4,5
75.10	14.0	14.0	14.0	14.0	14.0	70.0	9010	1,2,3,4,5
75.20	15.0	15.0	15.0	15.0	15.0	75.0	9880	1,2,3,4,5
75.30	17.5	17.5	17.5	17.5	17.5	Fully Open	10160	1,2,3,4,5
≥75.40	17.5	17.5	17.5	17.5	17.5	Fully Open	10250	
75.50	17.5	17.5	17.5	17.5	17.5	Fully Open	10340	

Under extreme circumstances, the mechanical capability of the gate operating system allows the facility to open each radial gate more than five metres within a one hour period. Accordingly, unless a mechanical breakdown is experienced, physical gate opening capability in unlikely to be a constraint in meeting projected gate opening targets. However in a loss of communications scenario, when extreme rises in lake level are being experienced, dam operators will have difficulty in continually matching minimum gate settings to lake level. Accordingly, in these circumstances when the dam level exceeds 74.0 AHD, it is permissible to estimate target dam levels one hour in advance, based on lake level rises in the previous hour and undertake gate operations on this basis.

In the event of one or more radial gates becoming jammed, the remaining gates are to be operated to provide the same total opening for a particular storage level, as shown in the Table 10.2. In these circumstances, gates are generally operated in the order of 3,2,4,1,5, moving through the sequence shown in the table.

In a loss of communication scenario, the bulkhead gate is only to be used to prevent a situation occurring which could endanger the safety of the dam. At the end of the event, the full supply level of the storage is to be achieved.

D1001

Somerset Dam Emergency Procedure

In the event of communications loss with the Flood Operations Centre, the Dam Supervisor at Somerset Dam is to assume responsibility for flood releases from the Dam. Once it has been established that communications have been lost, the Dam Supervisor at Somerset Dam is to:

- Take all practicable measures to restore communications and periodically check the lines of communication for any change;
- Undertake the actions set out below to release flood water from Somerset Dam;
- Log all actions in the Event Log;
- Ensure the dam is at full supply level at the end of the event;
- Remain in the general vicinity of the dam while on duty.

The actions to be undertaken to release flood water are:

- If communications with Wivenhoe Dam are lost, the level in Wivenhoe Dam is to be assumed as the level shown on gauge boards located downstream of Somerset Dam.
- The radial gates are to be kept raised to allow uncontrolled discharge.
- The regulators are to be closed if the tail water level exceeds EL 68.60 and are generally kept closed. The only exception to this is if the regulators are used to prevent overtopping of the dam.
- Sluice gates are operated as either fully opened or fully closed. The order of operation for opening the sluice gates is LMKNJOIP. Sluices are to be closed in reverse order of opening. Any inoperable sluices are to be dropped from the opening or closing sequences. The sluice gates are to be operated in accordance with the following procedures:
    - **Case 1** - the level in Somerset Dam is below EL 100.45; or
    - **Case 2** - the level in Somerset Dam is above EL 100.45.

  These procedures are described below.

D1002

Case 1 Procedure (Level in Somerset Dam is below EL 100.45)

The sluice gates are to be operated in accordance with the following table:

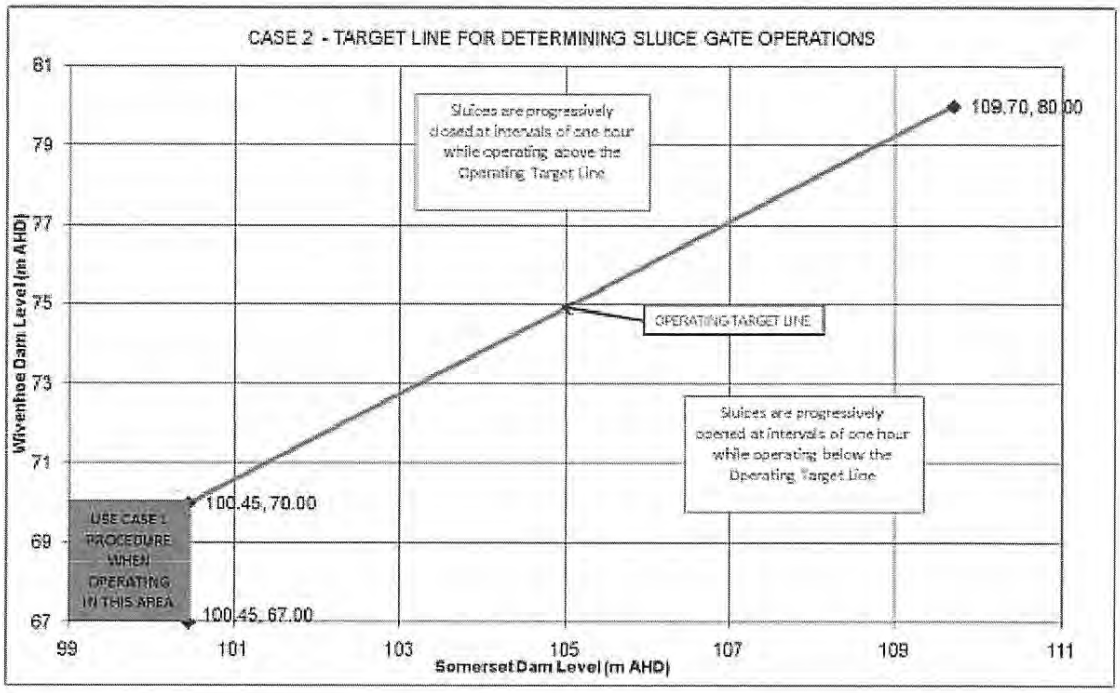
SOMERSET DAM LOSS OF COMMUNICATIONS CASE 1 PROCEDURE	
CONDITIONS AT SOMERSET AND WIVENHOE DAMS	**ACTIONS**
Level in Somerset Dam is below EL 100.45, Level in Wivenhoe Dam is below EL 70.0 and falling.	Sluice gates are to be opened at intervals of not less than 120 minutes, provided the number of open sluice gates does not exceed that shown in the "**SOMERSET DAM - MAXIMUM SLUICE GATE OPENING**" table. Once a sluice gate is opened, no further sluice gate operations are to be undertaken for 120 minutes.
Level in Somerset Dam is below EL 100.45, Level in Wivenhoe Dam is below EL 70.0 and rising.	Sluice gates are to be closed at intervals of not less than 180 minutes. Once a sluice gate is closed, no further sluice gate operations are to be undertaken for 180 minutes.
Level in Somerset Dam is below EL 100.45, Level in Wivenhoe Dam is above EL 70.0.	Sluice gates are to be closed at intervals of not less than 60 minutes. Once a sluice gate is closed, no further sluice gate operations are to be undertaken for 60 minutes.

SOMERSET DAM MAXIMUM SLUICE GATE OPENING	
SOMERSET DAM LEVEL	**MAXIMUM NUMBER OF SLUICE GATES ALLOWED TO BE OPEN**
99.00	0
99.05	1
99.15	2
99.31	3
99.51	4
99.75	5
100.04	6
100.37	7
>100.37	8

D1003

Case 2 Procedure (Level in Somerset Dam is above EL 100.45)

The sluices gates are to be operated in accordance with the following graph:



Sluices are progressively closed at one hour intervals if operating above the Operating Target Line and progressively opened at one hour intervals if operating below the Operating Target Line. The aim is always to follow the Operating Target Line as closely as possible.

10.4 Equipment Failure

In the event of equipment failure the action to be taken is indicated in Appendix E for Wivenhoe Dam and Appendix F for Somerset Dam.

D1004

APPENDIX A
AGENCIES HOLDING CONTROLLED COPIES OF THIS MANUAL

Agency	Responsible Person	Location
Seqwater	Dam Safety and Source Operations Manager	Brisbane
Seqwater	Principal Engineer Dam Safety	Ipswich
Seqwater	Storage Supervisor	Wivenhoe Dam
Seqwater	Storage Supervisor	Somerset Dam
Seqwater	Operations Coordinator	Central
Seqwater	Senior Flood Operations Engineer	Flood Operations Centre, Brisbane
Department of Environment and Natural Resources	Director Dam Safety	Brisbane
Department of Emergency Services	Duty Officer – Disaster Management Service	Brisbane
Somerset Regional Council	Local Disaster Response Coordinator	Esk
Ipswich City Council	Local Disaster Response Coordinator	Ipswich
Brisbane City Council	Local Disaster Response Coordinator	Brisbane
Emergency Management Queensland	Regional Director, Brisbane District	Brisbane

D1005

APPENDIX B
KEY REFERENCE GAUGES

Location	Gauge Zero	1974 Gauge Height	Minor Flood		Moderate Flood		Major Flood	
			Gauge Height	Flow	Gauge Height	Flow	Gauge Height	Flow
	m AHD	m	m	m^3/s	m	m^3/s	m	m^3/s
Stanley River at Somerset Dam	0.00	106.57	103.0		105.0		106.0	
Brisbane River at Lowood	23.68	22.02	8.0		15.0		20.0	
Brisbane River at Lowood	22.74	-	8.6	1,000	15.9	3,300	21.2	6,000
Brisbane River at Savages Crossing	18.43	23.79	9.0		16.0		21.0	
Brisbane River at Mt Crosby	0.00	26.74	11.0		13.0		21.0	
Bremer River at Ipswich	0.00	20.70	7.0		9.0		11.7	
Brisbane River at Moggill	0.00	19.95	10.0		13.0		15.5	
Brisbane River at Jindalee Bridge	0.00	14.10	6.0	4,000	8.0	5,000	10.0	6,500
Brisbane River at City Gauge	0.00	5.45	1.7		2.6		3.5	

Flows are approximate only and gauge heights are tide dependent in the lower reaches.

D1006

APPENDIX C
WIVENHOE DAM TECHNICAL DATA

STORAGE AND UNCONTROLLED GATE DISCHARGES						
Storage Level	**Storage Capacity**	**Flood Capacity (3)**	**Net Inflow per 1mm rise per hour (2)**	**Discharge per Regulator (1)**	**Discharge per Spillway Bay (1)**	**Maximum Available Discharge**
m AHD	$x10^3$ ML	10^6 m^3	m^3/s	m^3/s	m^3/s	m^3/s
57.0	414	-	11.1	24.9	0	50
57.5	453	-	12.0	25.2	4	69
58.0	466	-	13.0	25.4	15	128
58.5	494	-	13.9	25.7	32	211
59.0	523	-	14.8	25.9	53	316
59.5	553	-	15.8	26.2	77	439
60.0	584	-	16.7	26.4	105	579
60.5	616	-	17.6	26.6	136	735
61.0	649	-	18.6	26.9	170	905
61.5	683	-	19.5	27.1	207	1,090
62.0	719	-	20.5	27.3	246	1,290
62.5	756	-	21.3	27.5	288	1,495
63.0	795	-	22.3	27.8	333	1,720
63.5	835	-	23.3	28.0	379	1,950
64.0	877	-	24.2	28.2	428	2,195
64.5	920	-	25.1	28.4	479	2,450
65.0	965	-	26.1	28.7	532	2,720
65.5	1,012	-	27.0	28.9	587	2,995
66.0	1,061	-	27.9	29.1	645	3,280
66.5	1,112	-	28.9	29.3	704	3,580
67.0	1,165	0	29.8	29.5	765	3,885
67.5	1,220	56	30.7	29.7	828	4,200
68.0	1,276	112	31.7	29.9	893	4,525
68.5	1,334	171	32.6	30.1	959	4,860
69.0	1,393	230	33.5	30.3	1,028	5,200

D1007

Storage Level	Storage Capacity	Flood Capacity (3)	Net Inflow per 1mm rise per hour (2)	Discharge per Regulator (1)	Discharge per Spillway Bay (1)	Maximum Available Discharge
m AHD	x10^3 ML	10^6 m^3	m^3/s	m^3/s	m^3/s	m^3/s
69.5	1,454	290	34.5	30.5	1,098	5,550
70.0	1,517	350	35.4	30.7	1,170	5,910
70.5	1,581	418	36.3	30.9	1,244	6,280
71.0	1,647	485	37.3	31.1	1,319	6,660
71.5	1,714	550	38.2	31.3	1,396	7,040
72.0	1,783	615	39.1	31.5	1,474	7,430
72.5	1,854	683	40.1	31.7	1,554	7,840
73.0	1,926	750	41.0	31.9	1,636	8,240
73.5	2,000	830	41.9	32.1	1,719	8,660
74.0	2,076	910	42.9	32.3	1,804	9,080
74.5	2,153	995	43.8	32.5	1,890	9,520
75.0	2,232	1,080	44.7	32.7	1,978	9,960
75.5	2,313	1,160	45.7	32.9	2,067	10,400
76.0 (4)	2,395	1,240	46.6	33.1	2,158	10,860
76.5	2,480	1,258	47.6	33.3	2,250	11,320
77.0	2,566	1,420	48.5	33.4	2,343	11,780
77.5	2,655	1,500	49.4	36.6	2,438	12,260
78.0	2,746	1,580	50.4	33.8	2,535	12,740
78.5	2,839	1,680	51.3	34.0	2,632	13,230
79.0	2,934	1,780	52.2	34.2	2,700	13,500
79.5	3,032	1,880	54.4	34.4	2,700	13,500
80.0	3,132	1,980	55.6	34.6	2,700	13,500

(1) This is the maximum discharge of an individual spillway bay or regulator. Total discharge is calculated by adding the contributions of each gate or regulator. There are two (2) regulators to five (5) spillway bays.

(2) This assumes that all gates and sluices are closed. Discharges through the spillway have to be added to the above figures to calculate the actual inflow into the reservoir.

(3) The temporary storage above normal Full Supply Level of EL 67.0.

(4) The first fuse plug is designed to trigger at EL75.7. Above this level, fuse plug flows from Table E.3 need to be added to give the full outflow.

D1008

INDIVIDUAL RADIAL GATE - RATING TABLE (Outflows in m3/s – Gate Openings in metres open)

Water EL (m AHD)	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0
67.0	0	49	98	146	194	240	285	329	372	413	453	492	530	567	603	639	675	709	744	765															
67.2	0	49	99	148	196	243	288	333	376	418	458	498	537	574	611	648	684	720	755	790															
67.4	0	50	100	149	198	245	291	336	380	422	464	504	543	582	619	657	693	730	766	802	815														
67.6	0	50	101	151	200	248	294	340	384	427	469	510	550	589	627	665	702	740	777	814	841														
67.8	0	51	102	152	202	250	297	343	388	432	474	515	556	596	635	673	712	750	787	825	863	867													
68.0	0	51	103	154	204	253	300	347	392	436	479	521	562	603	642	682	721	759	798	837	876	893													
68.2	0	52	104	155	206	255	303	350	396	441	484	527	569	610	650	690	729	769	808	848	888	919													
68.4	0	52	105	156	207	257	306	354	400	445	489	532	575	616	657	698	738	778	818	859	899	940	946												
68.6	0	53	105	158	209	260	309	357	404	450	494	538	581	623	665	706	747	788	829	870	911	953	973												
68.8	0	53	106	159	211	262	312	360	408	454	499	543	587	630	672	714	755	797	838	880	923	965	1000												
69.0	0	54	107	160	213	264	315	364	412	458	504	549	593	636	679	722	764	806	848	891	934	977	1022	1028											
69.2	0	54	108	162	215	267	317	367	415	463	509	554	599	643	686	729	772	815	858	901	945	989	1035	1056											
69.4	0	54	109	163	217	269	320	370	419	467	514	560	605	649	693	737	780	824	868	912	956	1001	1047	1084											
69.6	0	55	110	164	218	271	323	373	423	471	518	565	611	656	700	744	789	833	877	922	967	1013	1060	1107	1112										
69.8	0	55	111	166	220	273	326	377	427	476	523	570	616	662	707	752	797	842	887	932	978	1025	1072	1121	1141										
70.0	0	56	112	167	222	276	328	380	430	479	528	575	622	668	714	759	805	850	896	942	989	1036	1085	1134	1170										
70.2	0	56	112	168	224	278	331	383	434	484	532	580	628	674	721	767	813	859	905	952	1000	1048	1097	1147	1198	1199									
70.4	0	56	113	170	225	280	334	386	437	488	537	586	633	680	727	774	821	867	914	962	1010	1059	1109	1160	1212	1229									
70.6	0	57	114	171	227	282	336	389	441	492	542	591	639	687	734	781	828	876	923	972	1020	1070	1121	1173	1226	1259									
70.8	0	57	115	172	229	284	339	392	445	496	546	596	644	693	741	788	836	884	932	981	1031	1081	1133	1185	1239	1289									
71.0	0	58	116	173	230	286	341	395	448	500	551	601	650	699	747	795	844	892	941	991	1041	1092	1144	1198	1252	1309	1319								
71.2	0	58	117	175	232	289	344	398	452	504	555	605	655	705	754	802	851	900	950	1000	1051	1103	1156	1210	1266	1323	1349								
71.4	0	58	117	176	234	291	347	401	455	508	559	610	661	710	760	809	859	908	959	1009	1061	1114	1167	1222	1279	1337	1380								
71.6	0	59	118	177	235	293	349	404	458	512	564	615	666	716	766	816	866	916	967	1019	1071	1124	1179	1234	1292	1350	1410	1411							
71.8	0	59	119	178	237	295	352	407	462	515	568	620	671	722	773	823	874	924	976	1028	1081	1135	1190	1246	1304	1364	1425	1443	GATE OVERTOPPED IN SHADED AREA						
72.0	0	60	120	180	239	297	354	410	465	519	572	625	676	728	779	830	881	932	984	1037	1091	1145	1201	1258	1317	1377	1439	1474							
72.2	0	60	121	181	240	299	357	413	469	523	577	629	682	733	785	837	888	940	993	1046	1100	1156	1212	1270	1330	1391	1454	1506							
72.4	0	60	121	182	242	301	359	416	472	527	581	634	687	739	791	843	895	948	1001	1055	1110	1165	1223	1282	1342	1404	1469	1533	1538						
72.6	0	61	122	183	243	303	361	419	475	531	585	639	692	745	797	850	903	956	1009	1064	1119	1176	1234	1293	1354	1417	1482	1548	1570						
72.8	0	61	123	184	245	305	364	422	478	534	589	643	697	750	803	856	910	963	1018	1073	1129	1186	1245	1305	1367	1430	1496	1563	1603						
73.0	0	62	124	185	247	307	366	425	482	538	593	648	702	756	809	863	917	971	1026	1081	1138	1195	1255	1316	1379	1443	1509	1577	1636						
73.2	2	62	124	187	248	309	369	427	485	542	597	653	707	761	815	869	924	978	1034	1090	1147	1206	1266	1327	1391	1456	1523	1592	1663	1669					
73.4	6	62	125	188	250	311	371	430	488	545	602	657	712	767	821	876	931	986	1042	1099	1156	1216	1276	1339	1403	1469	1536	1606	1678	1702					
73.6	11	64	126	189	251	313	373	433	491	549	606	662	717	772	827	882	937	993	1050	1107	1166	1225	1287	1350	1414	1481	1550	1620	1693	1736					
73.8	17	69	127	190	253	315	376	436	495	553	610	666	722	778	833	888	944	1001	1058	1116	1175	1236	1297	1361	1426	1494	1563	1635	1708	1770					

UNCONTROLLED DISCHARGE TO THE RIGHT OF THE RED LINE

INDIVIDUAL RADIAL GATE - RATING TABLE (Outflows in m3/s – Gate Openings in metres open)

Water EL (m AHD)	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5
74.0	23	74	129	191	254	317	378	438	498	556	614	671	727	783	839	895	951	1008	1066	1124	1184	1245	1307	1372	1438	1506	1576	1648	1723	1800	1804					
74.2	31	80	133	192	256	319	380	441	501	560	618	675	732	788	845	901	958	1015	1073	1132	1192	1254	1317	1382	1449	1518	1589	1662	1738	1815	1838					
74.4	39	87	139	195	257	321	383	444	504	563	622	679	737	793	850	907	964	1022	1081	1140	1201	1264	1327	1393	1461	1530	1602	1676	1752	1831	1873	UNCONTROLLED DISCHARGE				
74.6	47	94	146	200	259	322	385	447	507	567	626	684	741	799	856	913	971	1029	1089	1149	1210	1273	1337	1404	1472	1542	1615	1690	1767	1846	1908	TO THE RIGHT OF THE RED LINE				
74.8	56	103	153	206	262	324	387	449	510	570	629	688	746	804	862	919	978	1036	1096	1157	1219	1282	1347	1414	1483	1554	1628	1703	1781	1861	1943					
75.0	66	112	161	213	267	326	390	452	513	574	633	692	751	809	867	926	984	1044	1104	1165	1227	1291	1357	1425	1494	1566	1640	1717	1795	1876	1960	1978				
75.2	76	121	169	220	274	330	392	455	516	577	637	697	756	814	873	932	991	1051	1111	1173	1236	1301	1367	1435	1506	1578	1653	1730	1809	1891	1976	2013				
75.4	87	131	178	229	281	336	394	457	519	581	641	701	760	819	878	938	997	1057	1119	1181	1245	1310	1377	1446	1517	1590	1665	1743	1823	1906	1992	2049				
75.6	98	141	188	237	289	343	399	460	522	584	645	705	765	824	884	944	1004	1064	1126	1189	1253	1319	1386	1456	1527	1601	1678	1756	1837	1921	2007	2085				
75.8	109	152	198	247	298	350	405	463	525	587	649	709	769	829	889	949	1010	1071	1133	1197	1261	1328	1396	1460	1538	1613	1690	1769	1851	1936	2023	2112	2121			
76.0	121	164	209	257	307	359	412	468	528	591	652	713	774	834	895	955	1016	1078	1141	1205	1270	1337	1405	1476	1549	1624	1702	1782	1865	1950	2038	2129	2158			
76.2	133	176	220	268	317	368	421	475	532	594	656	718	779	839	900	961	1023	1085	1148	1212	1278	1346	1415	1486	1560	1636	1714	1795	1878	1965	2053	2145	2194			
76.4	146	187	232	279	327	378	429	483	539	597	660	722	783	844	906	967	1029	1092	1155	1220	1286	1354	1424	1496	1570	1647	1726	1808	1892	1979	2069	2161	2231			
76.6	159	200	244	290	338	388	439	492	546	603	664	726	788	849	911	973	1035	1098	1162	1228	1295	1363	1434	1506	1581	1658	1738	1820	1905	1993	2084	2177	2268			
76.8	173	213	257	302	350	399	449	501	554	610	668	730	792	854	916	978	1041	1105	1170	1235	1303	1372	1443	1516	1591	1669	1750	1833	1919	2007	2099	2193	2289	2306		
77.0	186	226	270	315	362	410	460	511	564	618	674	734	797	859	921	984	1047	1112	1177	1243	1311	1380	1452	1526	1602	1680	1762	1845	1932	2021	2113	2208	2306	2343		
77.2	200	240	283	328	374	422	471	522	574	627	682	739	801	864	927	990	1054	1118	1184	1250	1319	1389	1461	1536	1612	1691	1773	1858	1945	2035	2128	2224	2322	2381		
77.4	215	254	297	341	387	435	483	533	584	637	691	747	806	869	932	996	1060	1125	1191	1258	1327	1399	1470	1545	1622	1702	1785	1870	1958	2049	2143	2239	2339	2419		
77.6	230	269	311	355	400	447	496	545	595	647	700	756	813	873	937	1001	1066	1131	1198	1265	1335	1406	1479	1555	1633	1713	1796	1882	1971	2063	2157	2255	2355	2457	
77.8	245	283	325	369	414	461	508	557	607	658	711	765	821	880	942	1007	1072	1139	1205	1273	1343	1414	1488	1564	1643	1724	1808	1894	1984	2076	2172	2270	2371	2475	2496
	GATE OVERTOPPED IN SHADED AREA																																			
78.0	260	299	340	383	428	474	522	570	619	670	722	775	831	888	948	1012	1078	1144	1211	1280	1351	1423	1497	1574	1653	1735	1819	1907	1997	2090	2186	2285	2387	2492	2535
78.2	276	314	355	398	442	488	535	583	632	682	733	786	840	896	954	1018	1084	1150	1218	1288	1358	1431	1506	1583	1663	1745	1831	1919	2010	2104	2200	2300	2403	2509	2573
78.4	291	329	369	412	456	501	548	595	644	693	744	796	850	905	960	1023	1090	1157	1225	1295	1366	1440	1515	1593	1673	1756	1842	1931	2022	2117	2215	2316	2419	2526	2612
78.6	307	344	384	426	470	515	561	608	656	705	755	807	859	913	968	1029	1096	1163	1232	1302	1374	1448	1524	1602	1683	1767	1853	1943	2035	2131	2229	2331	2435	2543	2651
78.8	322	359	399	441	484	529	574	621	668	717	766	817	869	921	971	1034	1102	1170	1239	1310	1382	1456	1533	1612	1693	1778	1865	1955	2048	2144	2244	2346	2451	2560	2689
79.0	338	374	414	455	498	542	588	634	681	729	778	827	878	929	977	1040	1109	1176	1246	1317	1390	1466	1542	1621	1703	1788	1876	1967	2061	2158	2258	2361	2467	2577	2700
79.2	353	389	428	470	512	556	601	646	693	740	789	838	888	938	993	1046	1114	1183	1253	1324	1398	1473	1551	1631	1714	1799	1887	1979	2074	2171	2272	2376	2483	2594	2700*
79.4	368	404	443	484	526	570	614	659	705	752	800	848	897	946	998	1051	1120	1189	1260	1332	1406	1481	1560	1640	1724	1810	1899	1991	2086	2185	2287	2391	2499	2610	2700*
79.6	384	419	458	498	540	583	627	672	717	764	811	859	907	954	994	1057	1126	1195	1266	1339	1413	1490	1569	1650	1734	1820	1910	2003	2099	2198	2301	2407	2516	2627	2700*
79.8	399	435	473	513	554	597	640	685	730	775	822	869	916	963	1000	1062	1132	1202	1273	1346	1421	1499	1578	1659	1744	1831	1922	2015	2112	2212	2315	2422	2532	2644	2700*
80.0	415	450	487	527	568	610	654	697	742	787	833	879	926	971	1006	1068	1137	1208	1280	1354	1429	1507	1586	1669	1754	1842	1933	2027	2125	2226	2330	2437	2548	2661	2700*

* Flow impacted by bridge deck.

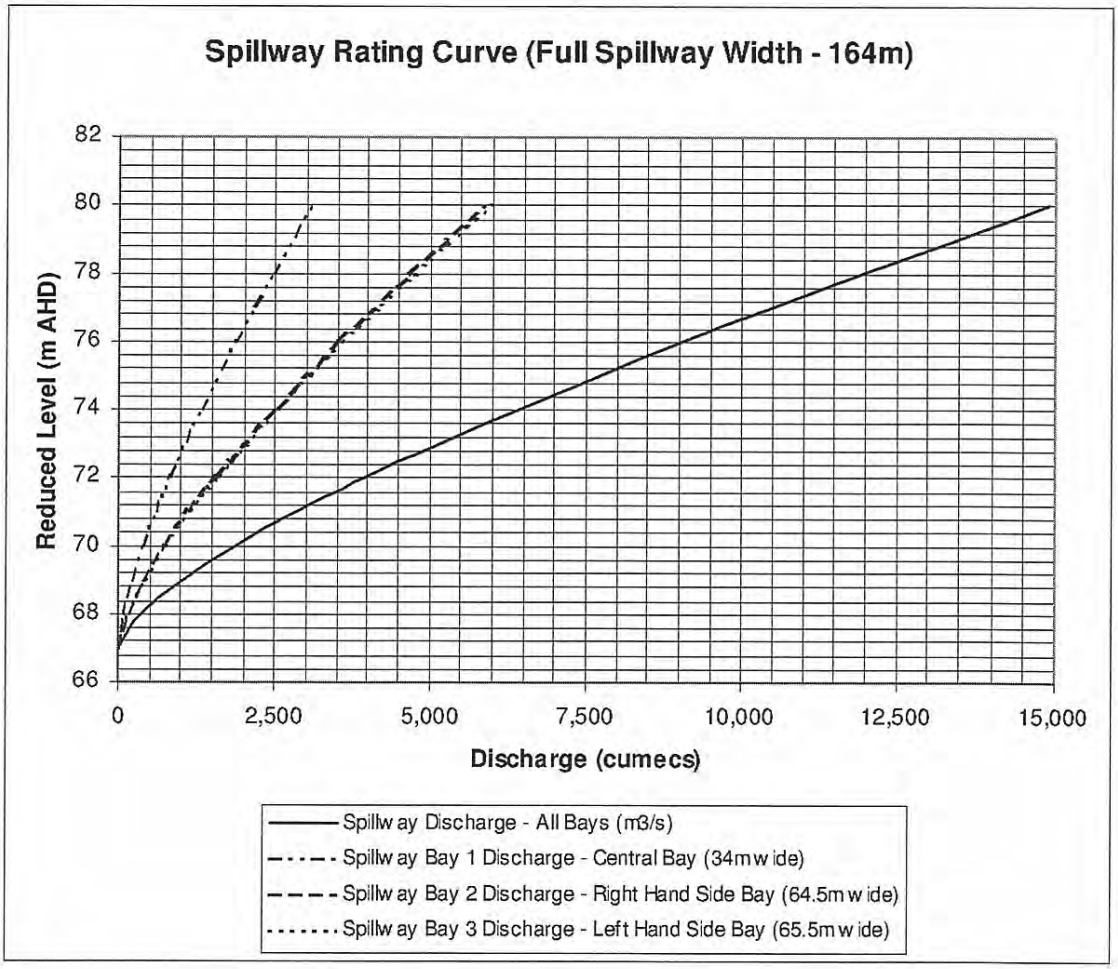
WIVENHOE DAM RADIAL GATES
TOP AND BOTTOM GATE LEVELS FOR VARIOUS GATE OPENINGS

GATE OPENING (m)	BOTTOM OF GATE (m AHD)	TOP OF GATE (m AHD)	GATE OPENING (m)	BOTTOM OF GATE (m AHD)	TOP OF GATE (m AHD)
0.0	56.36	73.00	8.6	64.57	78.70
0.2	56.53	73.17	8.8	64.77	78.79
0.4	56.70	73.34	9.0	64.97	78.88
0.6	56.88	73.50	9.2	65.17	78.96
0.8	57.06	73.67	9.4	65.37	79.04
1.0	57.24	73.83	9.6	65.57	79.12
1.2	57.42	73.99	9.8	65.77	79.20
1.4	57.60	74.15	10.0	65.97	79.28
1.6	57.78	74.31	10.2	66.17	79.35
1.8	57.96	74.46	10.4	66.37	79.42
2.0	58.14	74.62	10.6	66.57	79.49
2.2	58.33	74.77	10.8	66.76	79.55
2.4	58.51	74.92	11.0	66.96	79.62
2.6	58.70	75.07	11.2	67.16	79.68
2.8	58.89	75.22	11.4	67.36	79.74
3.0	59.08	75.37	11.6	67.55	79.79
3.2	59.27	75.51	11.8	67.75	79.85
3.4	59.46	75.66	12.0	67.94	79.90
3.6	59.65	75.80	12.2	68.14	79.95
3.8	59.84	75.94	12.4	68.33	80.00
4.0	60.03	76.07	12.6	68.53	80.04
4.2	60.22	76.21	12.8	68.72	80.08
4.4	60.42	76.34	13.0	68.91	80.12
4.6	60.61	76.48	13.2	69.10	80.16
4.8	60.80	76.61	13.4	69.29	80.19
5.0	61.00	76.74	13.6	69.48	80.22
5.2	61.19	76.86	13.8	69.67	80.25
5.4	61.39	76.99	14.0	69.86	80.28
5.6	61.59	77.11	14.2	70.05	80.31
5.8	61.78	77.23	14.4	70.24	80.33
6.0	61.98	77.35	14.6	70.42	80.35
6.2	62.18	77.47	14.8	70.61	80.36
6.4	62.38	77.58	15.0	70.79	80.38
6.6	62.58	77.69	15.2	70.97	80.39
6.8	62.78	77.80	15.4	71.15	80.40
7.0	62.97	77.91	15.6	71.34	80.41
7.2	63.17	78.02	15.8	71.52	80.41
7.4	63.37	78.12	16.0	71.69	80.41
7.6	63.57	78.22	16.2	71.87	80.41
7.8	63.77	78.32	16.4	72.05	80.41
8.0	63.97	78.42	16.6	72.22	80.41
8.2	64.17	78.52	16.8	72.40	80.40
8.4	64.37	78.61	17.0	72.57	80.39
8.6	64.57	78.70	17.2	72.74	80.38
8.8	64.77	78.79	17.4	72.91	80.36
9.0	64.97	78.88	17.5	73.00	80.35

D1011

WIVENHOE DAM AUXILIARY SPILLWAY RATING TABLE

Storage Level	Spillway Discharge			
	Central Bay (34m wide)	Right Side Bay (64.5m wide)	Left Side Bay (65.5m wide)	All Bays
m AHD	m^3/s	m^3/s	m^3/s	m^3/s
67	0	0	0	0
68	75	142	144	361
69	212	401	408	1,020
70	385	731	742	1,858
71	590	1,120	1,137	2,847
72	821	1,558	1,582	3,961
74	1,329	2,521	2,560	6,409
76	1,873	3,553	3,608	9,033
78	2,468	4,683	4,755	11,907
80	3,092	5,865	5,956	14,913



D1012

APPENDIX D
SOMERSET DAM TECHNICAL DATA

STORAGE AND DISCHARGE CHARACTERISTICS							
Storage Level	**Reservoir Capacity**	**Temporary Flood Storage**	**Inflow to produce 1mm rise per hour**	**Discharge per Regulator**	**Discharge per Sluice**	**Discharge per Spillway Bay**	**Maximum Available Discharge**
m AHD	x10^3 ML	10^6 m^3	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s
90.0	120.3	-	5.3	57	163	-	1,529
90.5	129.5	-	5.5	58	165	-	1,550
91.0	139.3	-	4.9	58	167	-	1,572
91.5	149.6	-	5.3	59	170	-	1,593
92.0	160.5	-	5.7	60	172	-	1,614
92.5	172.0	-	6.1	60	174	-	1,635
93.0	184.1	-	6.8	61	176	-	1,655
93.5	196.7	-	7.1	62	179	-	1,676
94.0	210.0	-	7.4	62	181	-	1,695
94.5	224.0	-	7.8	63	183	-	1,715
95.0	238.5	-	8.2	64	185	-	1,735
95.5	253.6	-	8.5	64	187	-	1,754
96.0	269.3	-	9.0	65	189	-	1,773
96.5	285.6	-	9.4	66	191	-	1,792
97.0	302.7	-	9.8	66	193	-	1,810
97.5	320.7	-	10.3	67	195	-	1,829
98.0	339.5	-	10.8	67	197	-	1,847
98.5	359.2	-	11.2	68	199	-	1,865
99.0	379.8	0	11.8	69	201	-	1,883
99.5	401.4	22	12.3	69	203	-	1,901
100.0	428.9	49	13.3	70	205	-	1,918
100.5	447.5	68	13.8	70	207	0	1,937
101.0	472.2	92	14.4	71	209	4	1,989
101.5	498.0	118	15.0	72	211	13	2,076
102.0	524.9	145	15.5	72	212	25	2,189
102.5	553.1	173	16.1	73	214	40	2,325
103.0	582.6	203	16.7	73	216	58	2,482
103.5	613.2	233	17.3	74	218	78	2,659
104.0	645.1	265	17.9	74	220	100	2,854
104.5	678.3	298	18.5	75	221	125	3,067
105.0	712.7	333	19.1	75	223	151	3,296

D1013

Storage Level	Reservoir Capacity	Temporary Flood Storage	Inflow to produce 1mm rise per hour	Discharge per Regulator	Discharge per Sluice	Discharge per Spillway Bay	Maximum Available Discharge
m AHD	$x10^3$ ML	10^6 m^3	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s
105.5	748.3	368	19.8	76	225	180	3,542
106.0	785.2	405	20.4	76	226	211	3,803
106.5	823.4	444	21.1	77	228	243	4,079
107.0	863.1	483	21.7	77	230	278	4,370
107.5	904.0	524	22.4	78	232	314	4,675
108.0	946.4	567	23.6	78	233	352	5,084
108.5	990.1	610	24.3	79	235	391	5,570
109.0	1035.3	656	23.1	79	236	433	6,111
109.5	1081.8	702	25.8	80	238	476	6,701
110.0	1129.8	750	26.7	80	240	520	7,334

The outlet works for Somerset Dam consist of:

- Four (4) cone dispersion type regulator values.
- Eight (8) sluice gates.
- Eight (8) radial crest gates.

The regulator values are drowned out when the dam tail water level (Wivenhoe headwater level) reaches EL 68.6 m AHD and the valves should generally not be used under these conditions. Discharge for each regulator valve may be computed using the following equation:

$$Q_{Regulator} = 12.714*(\text{Dam Headwater Elevation} - 70.20)^{0.5}$$

Discharge for each sluice gate may be computed using the following equation:

$$Q_{Sluice} = 40.022*(\text{Dam Headwater Elevation} - 73.15)^{0.4963}$$

The radial crest gates are normally kept open and come into operation whenever the headwater level exceeds EL 100.45. Discharge for each radial gate may be computed using the following equation:

$$Q_{Crest} = 12.137*(\text{Dam Headwater Elevation} - 100.45)^{1.6653}$$

At EL 107.45, flood waters commence to flow over the dam crest. To account for this discharge, the dam crest is assumed to operate as a broad crested weir with a spillway width of 135.33 m and a weir coefficient of 1.7. Discharge in these circumstances may be computed using the following equation:

$$Q_{Overflow} = 1.7*135.33*(\text{Dam Headwater Elevation} - 107.455)^{1.5}$$

D1014

APPENDIX E
WIVENHOE DAM GATE OPERATION CONSIDERATIONS

SPILLWAY OPERATION PRINCIPLES

The radial gates are sequentially numbered from 1 to 5 from left to right looking in the downstream direction. Plans of the dam and spillway are contained in Appendix H.

The flip bucket spillway is designed to control the discharge from the reservoir and to dissipate the energy of the discharge. The flip throws the discharge clear of the concrete structures into a plunge pool where the energy is dissipated by turbulence. Under non-symmetric flow conditions, or when gates 1 and 5 are not operating, the discharge jet may impinge on the walls of the plunge pool, which has been excavated into erodible sandstone rock, and cause non-predictable erosion. Upstream migration of this erosion is to be avoided. The wing walls adjacent to the flip bucket deflect the discharge away from the walls of the plunge pool when gates 1 and 5 are operated.

Therefore in operating the spillway, the principles to be observed are, in order of priority:

(i) The discharge jet into the plunge pool is not to impinge on the right or left walls of the plunge pool.

(ii) The flow in the spillway is to be generally symmetrical.

The main purpose of gating the spillway is to exercise maximum possible control over the flow in the Brisbane River insofar as river flows in excess of 4,000 m^3/s cause damage to urban areas downstream. The gates also allow the routing of much larger floods with substantial flood mitigation being achieved.

RADIAL GATE OPERATION PRINCIPLES

Each radial gate consists of a cylindrical upstream skin-plate segment that is attached to the radial arms. The cylindrical axis is horizontal. Each gate rotates about two spherical trunnion bearings that are on this axis.

The position of the gate is controlled by hydraulically driven winches that are located on the piers beside the gates. Wire ropes are attached to the downstream face of the skin plate through a pulley system. The hydraulic motors work off a common pressure manifold and under perfectly matched conditions, will give an equal lifting force to each side of the gate. This system does not sense rope travel and will take up slack rope. It cannot prevent or correct skewing of the skin plate segment between the piers. If skewing occurs, skids will come into contact with the side seal plates to limit movement.

It is not possible to operate a winch independently of the other winch attached to the gate.

When the hydraulic motors are not energised, the gates are held in position by spring loaded friction brakes on the winches. There are two brake bands per winch and each band is capable of supporting half the weight of the gate. One winch can support the total weight of a gate on both its brake bands but not on one.

D1015

While the radial gates have been designed to withstand overtopping, it should be avoided if possible. The reservoir levels and the structural state of the radial gates when in the closed position are as follows:

Reservoir Level m AHD	Radial Gate Stress Condition with Gate Closed
73	Normal
77	33% Overstress
79	Critical

Once overtopped, the gates become inoperable when the lifting tackle is fouled by debris from the overflow. The gates remain structurally secure until the reservoir level exceeds EL 77. The ability to control floods however may be lost.

FREE FALL OF THE RADIAL GATES

Under no circumstances are the radial gates allowed to free fall. The lower skin plate sections are overstressed if a freefall of 60 mm is arrested by the seal plate on the spillway.

If a gate becomes stuck in an open position, attempts are to be made to free the gate by applying positive lifting forces. Under no circumstances are the winches to be unloaded and the direct weight of the gates used to yield the obstruction.

OPERATION IN HIGH WIND

Other than in periods of mitigation of medium and major floods, the gates are not to be raised or lowered when clear of water, during periods of high winds. The gates can however, be held on the brakes in any position in the presence of high wind.

The term "high wind" means any wind that causes twisting or movement of the gate. While a precise figure cannot be placed on these velocities, further experience over time may allow a figure to be determined.

This limitation is required to prevent the gate from twisting from skew on one side to skew on the other side. While the gate is being raised or lowered, skewing cannot be prevented by the hydraulic lifting system and any impact forces encountered may damage the gate.

MAINTENANCE CONSIDERATIONS

No more than one gate is to be inoperable at any one time for maintenance. The maintenance is to be scheduled so that the spillway bay can be cleared of obstructions in a reasonable time to allow its use in the event of major flooding.

BULKHEAD GATE OPERATING LIMITATIONS

The bulkhead gate can be used to control discharge in an emergency situation where a radial gate is inoperable. It is transported to, and lowered upstream of the inoperable radial gate by means of the gantry crane. The following conditions apply:

(a) The bulkhead gate can always be lowered with any type of underflow; and

D1016

(b) It is not possible to raise the bulkhead gate once it has been lowered past certain levels depending on upstream conditions without there being a pool of water between it and the radial gate.

It is thus possible to preserve storage by effectively closing the spillway even with one radial gate inoperable. It will not be possible to raise the bulkhead gate until the radial gate behind has been repaired and is again storing water between the bulkhead gate and itself.

The bulkhead gate is not to be used for flood regulation until the reservoir level is falling and not likely to rise within the period needed to repair the inoperable radial gate.

The spillway gantry crane is to be used to raise and lower the bulkhead gate. The crane operates at two speeds, 1.5 and 3.0 m/min. When within the bulkhead gate guides, the bulkhead gate is to be moved only at 1.5 m/min.

BULKHEAD GATE OVERTOPPING

In the event that the bulkhead gate is overtopped (reservoir level exceeds EL 69 when bulkhead gate is closed), it cannot be removed unless a pool of water fills the space between it and the radial gate behind. The closed bulkhead becomes critically stressed when the reservoir level overtops it to EL 71.4.

It is not possible to engage the lifting tackle while overtopping is occurring. While there is any risk that the bulkhead gate may be overtopped, the lifting gear is to be left engaged so that the gate can be raised once the downstream radial gate becomes operable.

BULKHEAD GATE DISCHARGE REGULATION

This procedure should only be used if the safety of the dam is at direct risk.

In the event that a radial gate is inoperable in a partially open position, the bulkhead gate can be used for flow regulation provided that the lower lip of the radial gate is clear of the underflow jet.

Where a pool exists between the bulkhead gate and a radial gate under flow conditions, the bulkhead gate will be subjected to additional pull-down and possibly subjected to vortex-induced vibrations. When this condition occurs, the bulkhead gate is to be lowered to dewater the pool. The bulkhead gate can then be adjusted to regulate the flow provided the underflow jet remains below the lower lip of the radial gate.

INOPERABLE RADIAL GATES

In the event of a major flood, where the full discharge capacity of the four operable radial gates is required, these gates are to be used to their full capacity to protect the embankment from overtopping. Under certain abnormal conditions, it may not be possible to operate one gate. The following guidelines are to be adopted.

(a) Gate 3 Inoperable

Gates 2 and 4 are to be used to regulate flood discharges, until the discharge impinges on the walls of the plunge pool. Gates 1 and 5 are then to be opened sufficiently to deflect the discharge into the plunge pool.

D1017

The bottoms of gates 1 and 5 are to be maintained at or below those of gates 2 and 4 respectively.

(b) Either Gate 2 or 4 Inoperable

Normal gate operating procedures are to be adopted, except that only the operable gate 2 or 4 is available for flood regulation beyond 500 m^3/s and not both.

(c) Either Gate 1 or 5 Inoperable

Normal gate operating procedures are to be adopted until the discharge impinges on the walls of the plunge pool. Thereafter the operable gate 1 or 5 is to be used in lieu of using the radial gate adjacent to the inoperable gate. The other radial gates are to be used in the normal way to control discharge.

EQUIPMENT MALFUNCTION

Normal gate operation is by means of two electric hydraulic pumps supplied by external mains supply electric power, with pump number 1 connected to gates 1 and 2 and the penstock gate, while pump number 2 is connected to gates 3, 4 and 5.

Normal gate operation may not be possible in the event of equipment malfunctions during the passing of a flood. The procedures to be followed under various possible events are outlined below.

Failure of External Electric Power

A diesel electric generator is used to provide a power supply. The generator supplies sufficient power to operate the gates normally.

Failure of One Electric Hydraulic Pump

In the event that one electric hydraulic pump fails, the connecting valves between pumps are to be switched such that both sets of hydraulic lines are connected to the operable pump, thus permitting operation of all 5 gates, one gate at a time.

Failure of Two Electric Hydraulic Pumps

In the event that both electric hydraulic pumps fail, either the mobile or fixed emergency diesel hydraulic pump is to be used to operate the gates, one gate at a time.

Rupture of Hydraulic Lines

Depending on location and severity, a hydraulic line rupture may cause a radial gate to become inoperable. Accordingly any ruptures to the hydraulic lines are to be repaired as soon as practical. Depending on the location of the rupture, it may be possible to use the mobile emergency diesel hydraulic pump to operate the impacted gate.

Contamination of Winch Brakes

Oil contamination of the winch brakes will reduce their holding capacity and possibly allow the gate to fall. The brake bands are to be inspected regularly and cleaned immediately if any contamination is observed.

Fouling of Radial Gate Lifting Tackle

D1018

The lifting tackle consists of blocks, wire ropes and winch drums. If the gate is overtopped, debris may be collected on the wire ropes that may in turn foul the blocks or the winch drums. This may result in jamming of the wire rope or in uneven lifting, both of which may cause the gate to jam.

Fouling of Side Skids

The side skids have been designed to limit the side-sway and skew of the radial gates during operation. Under ideal conditions, the skids should not be in contact with the side seal plates.

If the winches are lifting the gates unevenly or in a skewed position, the lifting gear should be adjusted if possible.

D1019

APPENDIX F
SOMERSET DAM AUXILIARY EQUIPMENT

DISCHARGE REGULATION

The normal operating procedure for Somerset Dam in the event of a flood requires the spillway gates to be raised to provide an uncontrolled spillway followed by opening of the low level outlets some time later. Plans of the dam and spillway are contained in Appendix I.

EMERGENCY POWER SUPPLY

In the event of a power failure at Somerset Dam, both a fixed and a mobile diesel generator are available to operate the regulators, sluice gates and radial gates. The fixed generator can also power the crane. A mobile auxiliary generator is also available for emergency operation of the regulators and gates.

FAILURE OF SPILLWAY GATES MACHINERY

If a spillway gate cannot be raised due to failure of the lifting machinery, the gantry crane may be attached to the gate and the gate can be raised using the gantry crane.

FAILURE OF SLUICE GATE MACHINERY

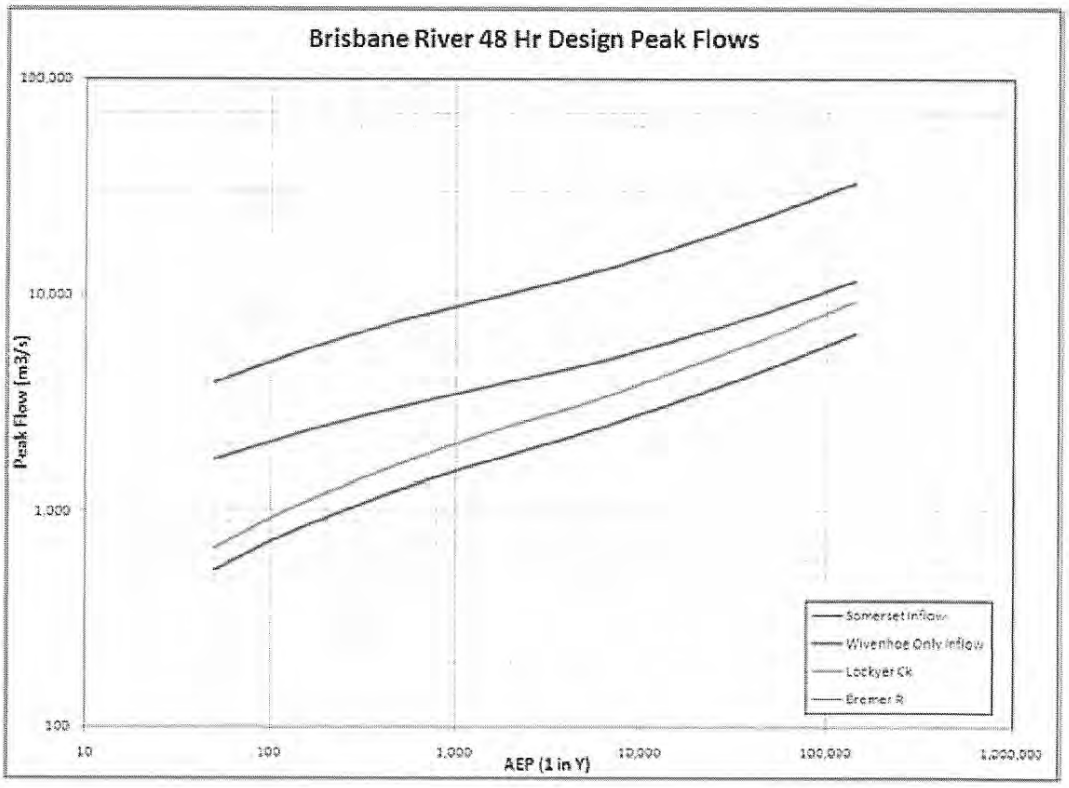
In the event of a sluice gate being jammed in the open position or the lifting machinery failing, the coaster gate at the dam can be lowered over the inlet to the sluice to preserve the water supply storage.

D1020

APPENDIX G
HYDROLOGIC INVESTIGATIONS

The design hydrology for the Manual is based on the design hydrology undertaken in September 2005 in conjunction with the flood discharge capacity upgrade of Wivenhoe Dam. This work was undertaken by the Wivenhoe Alliance, the group responsible for undertaking the upgrade work. (Wivenhoe Alliance, Design Discharges and Downstream Impacts of the Wivenhoe Dam Upgrade Q1091, Sep 2005)

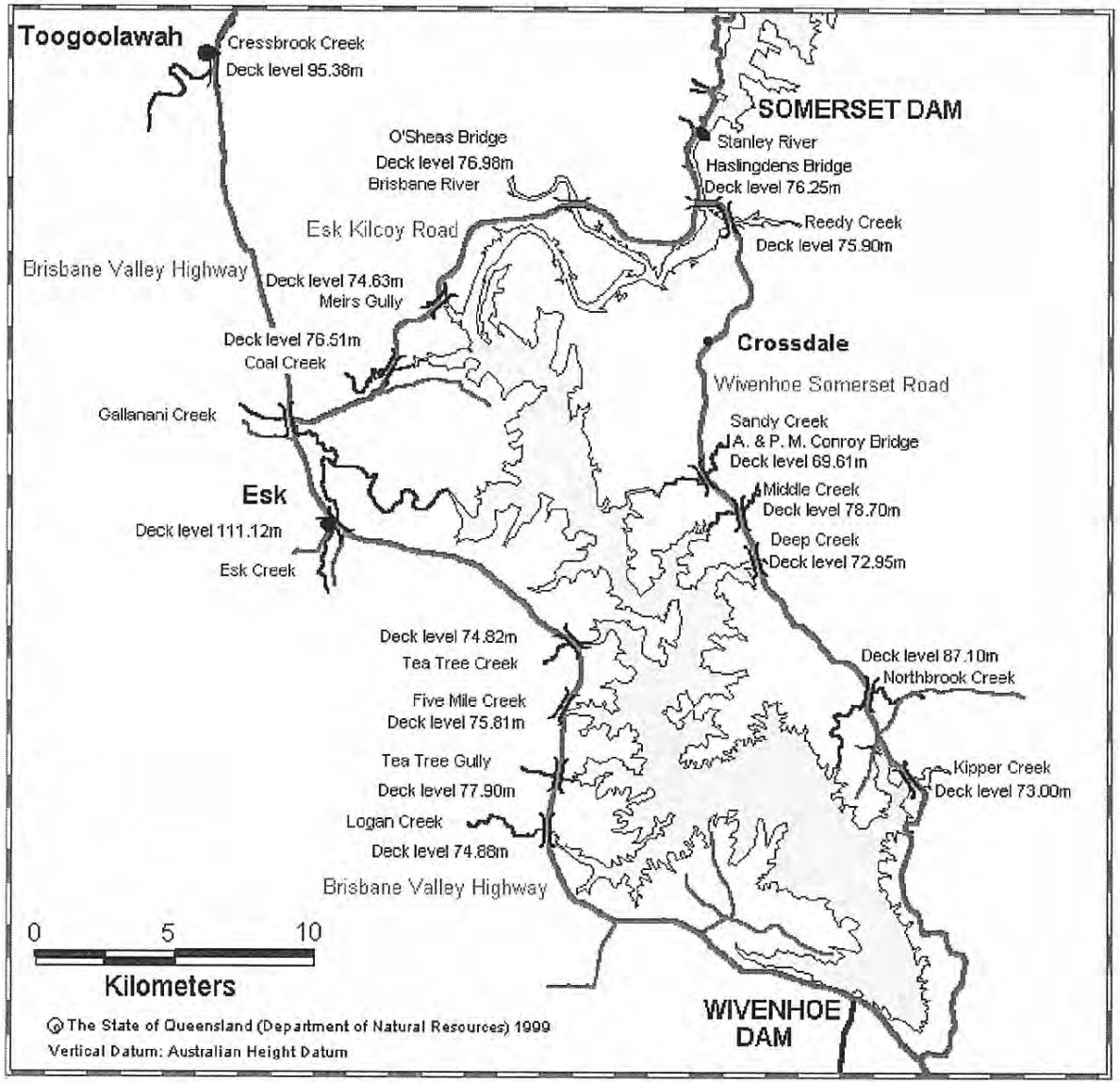
Floods in the Brisbane River catchment above Wivenhoe Dam can originate in either the Stanley River or upper Brisbane River catchment or both. Both of the dams are capable of being operated in a number of ways, each of which will reduce the flow downstream. Indicative inflows for the dams for 48 hour storm events (the critical duration for Wivenhoe Dam) are shown in the graph below. Full results containing inflows for a range of storm events and durations are contained in the Alliance reports.



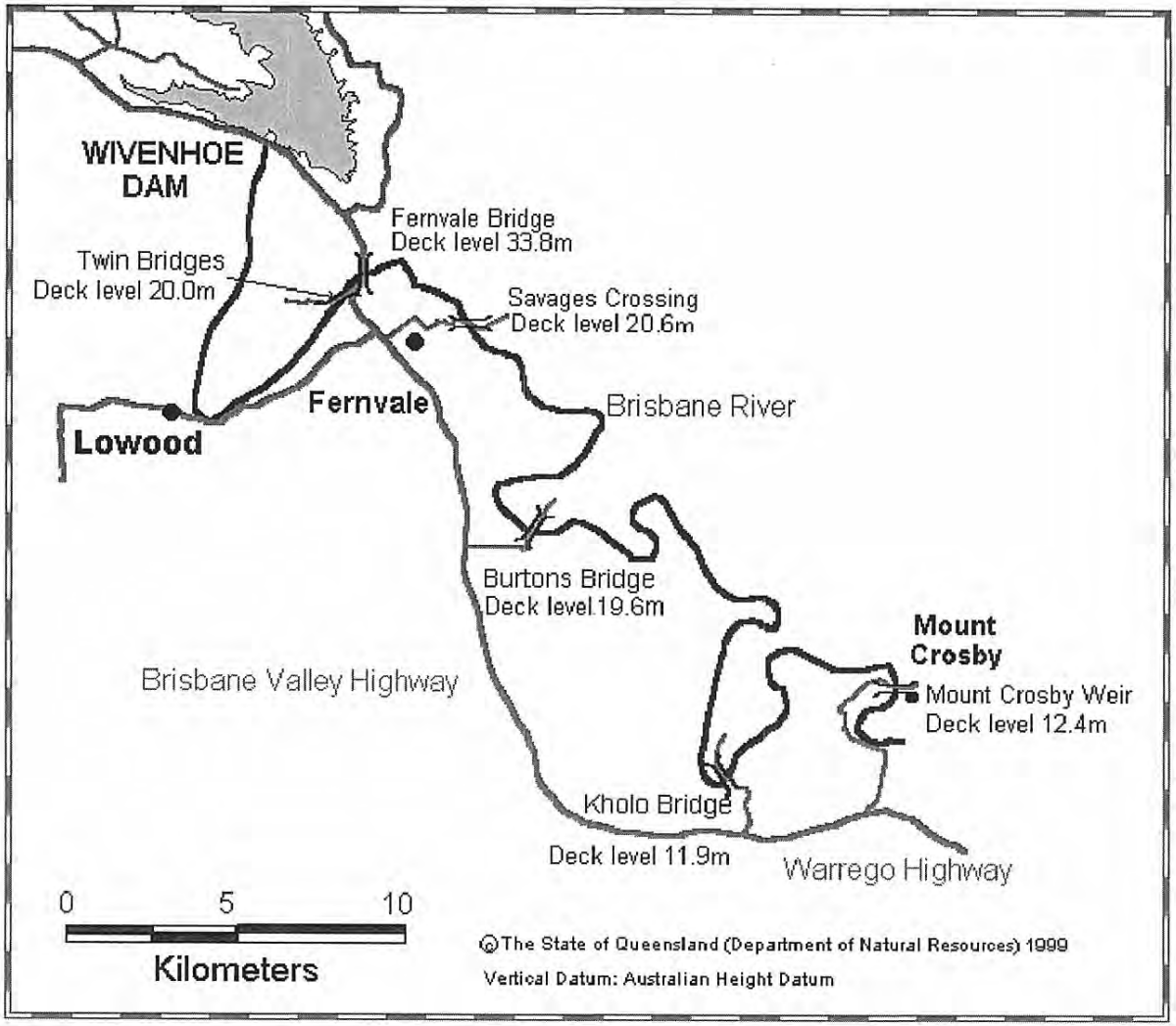
D1021

APPENDIX H
WIVENHOE DAM
PLANS, MAPS AND PHOTOGRAPHS

D1022


Toogoolawah
Cressbrook Creek
Deck level 95.38m
SOMERSET DAM
O'Sheas Bridge
Deck level 76.98m
Brisbane River
Stanley River
Haslingdens Bridge
Deck level 76.25m
Esk Kilcoy Road
Reedy Creek
Deck level 75.90m
Brisbane Valley Highway
Deck level 74.63m
Meirs Gully
Crossdale
Deck level 76.51m
Coal Creek
Wivenhoe Somerset Road
Gallanani Creek
Sandy Creek
A. & P. M. Conroy Bridge
Deck level 69.61m
Esk
Middle Creek
Deck level 78.70m
Deck level 111.12m
Deep Creek
Deck level 72.95m
Esk Creek
Deck level 74.82m
Tea Tree Creek
Deck level 87.10m
Northbrook Creek
Five Mile Creek
Deck level 75.81m
Tea Tree Gully
Kipper Creek
Deck level 77.90m
Deck level 73.00m
Logan Creek
Deck level 74.88m
Brisbane Valley Highway
0 5 10
Kilometers
© The State of Queensland (Department of Natural Resources) 1999
Vertical Datum: Australian Height Datum
WIVENHOE DAM

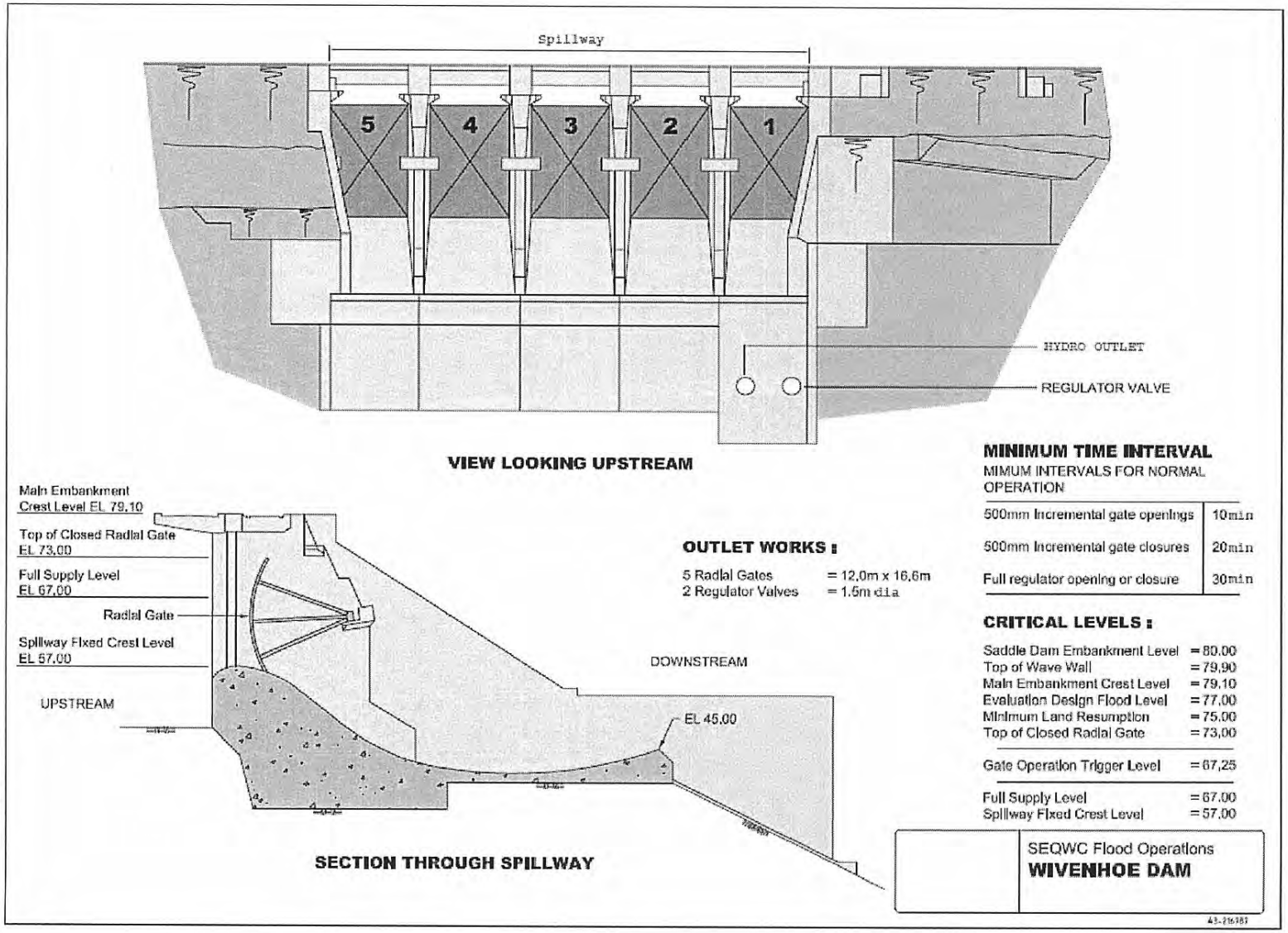
D1023

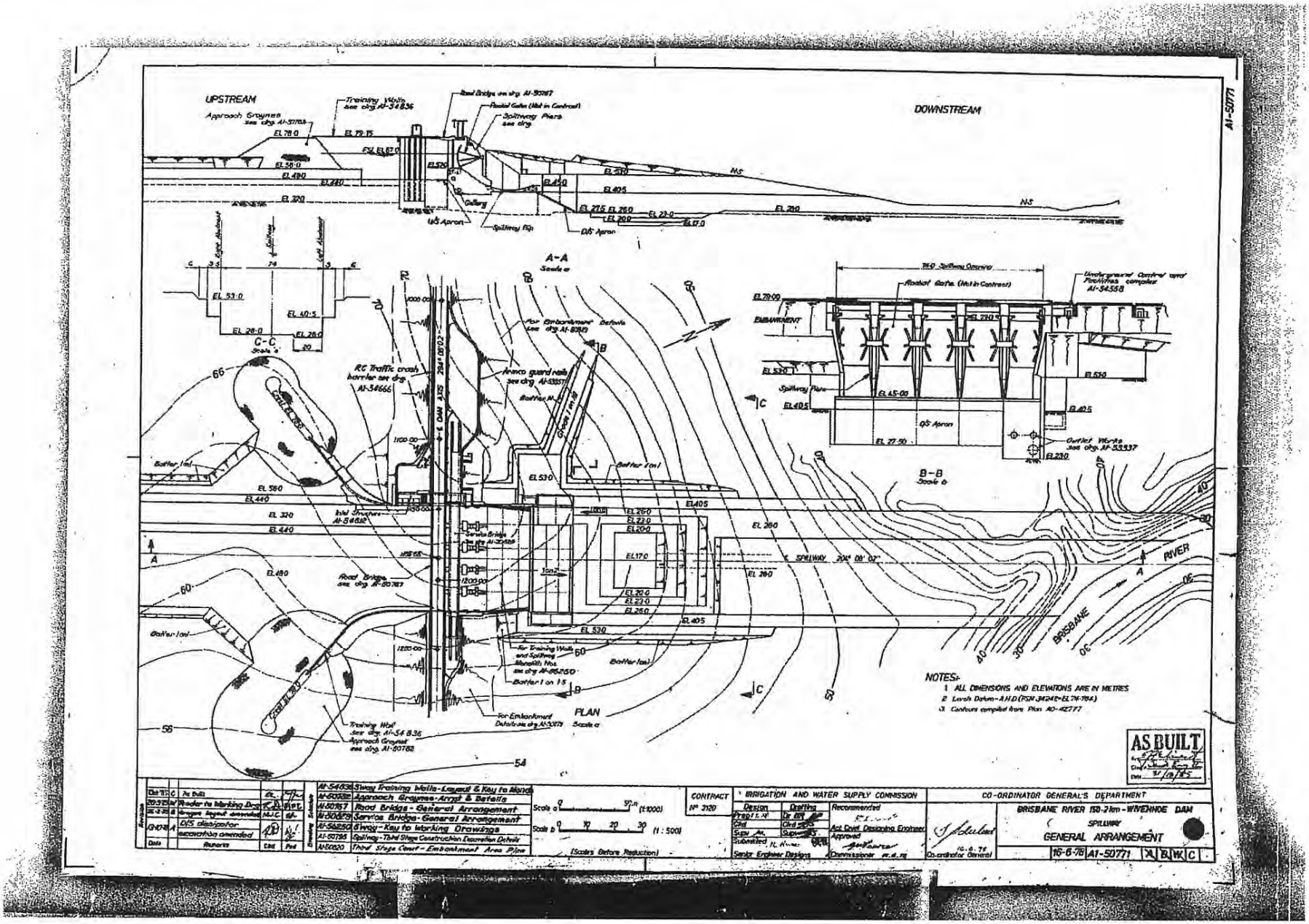

WIVENHOE
DAM
Fernvale Bridge
Deck level 33.8m
Twin Bridges
Deck level 20.0m
Savages Crossing
Deck level 20.6m
Fernvale
Brisbane River
Lowood
Burtons Bridge
Deck level 19.6m
Mount
Crosby
Brisbane Valley Highway
Mount Crosby Weir
Deck level 12.4m
Kholo Bridge
Deck level 11.9m
Warrego Highway
0
5
10
Kilometers
©The State of Queensland (Department of Natural Resources) 1999
Vertical Datum: Australian Height Datum

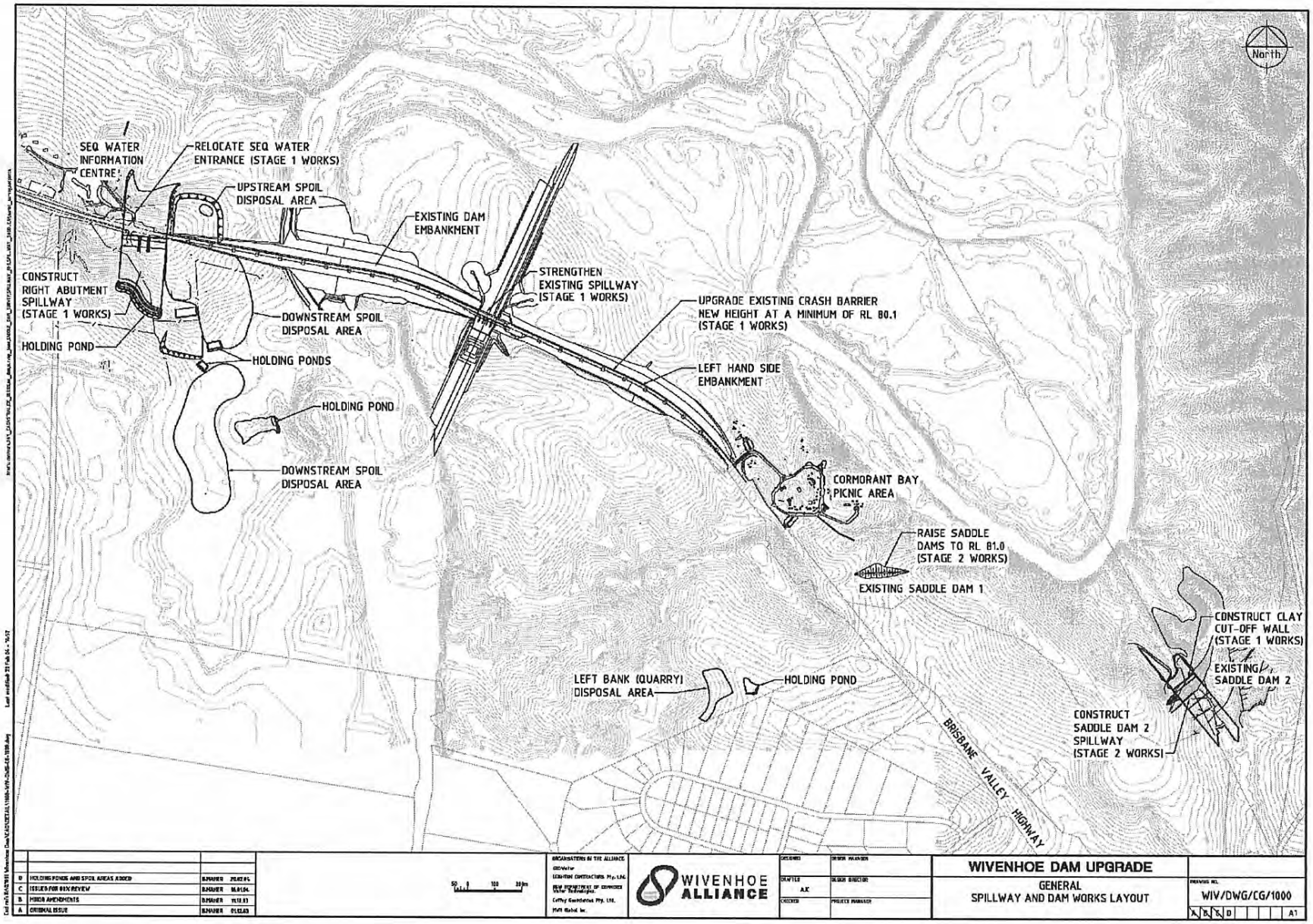
Wivenhoe Dam



D1025

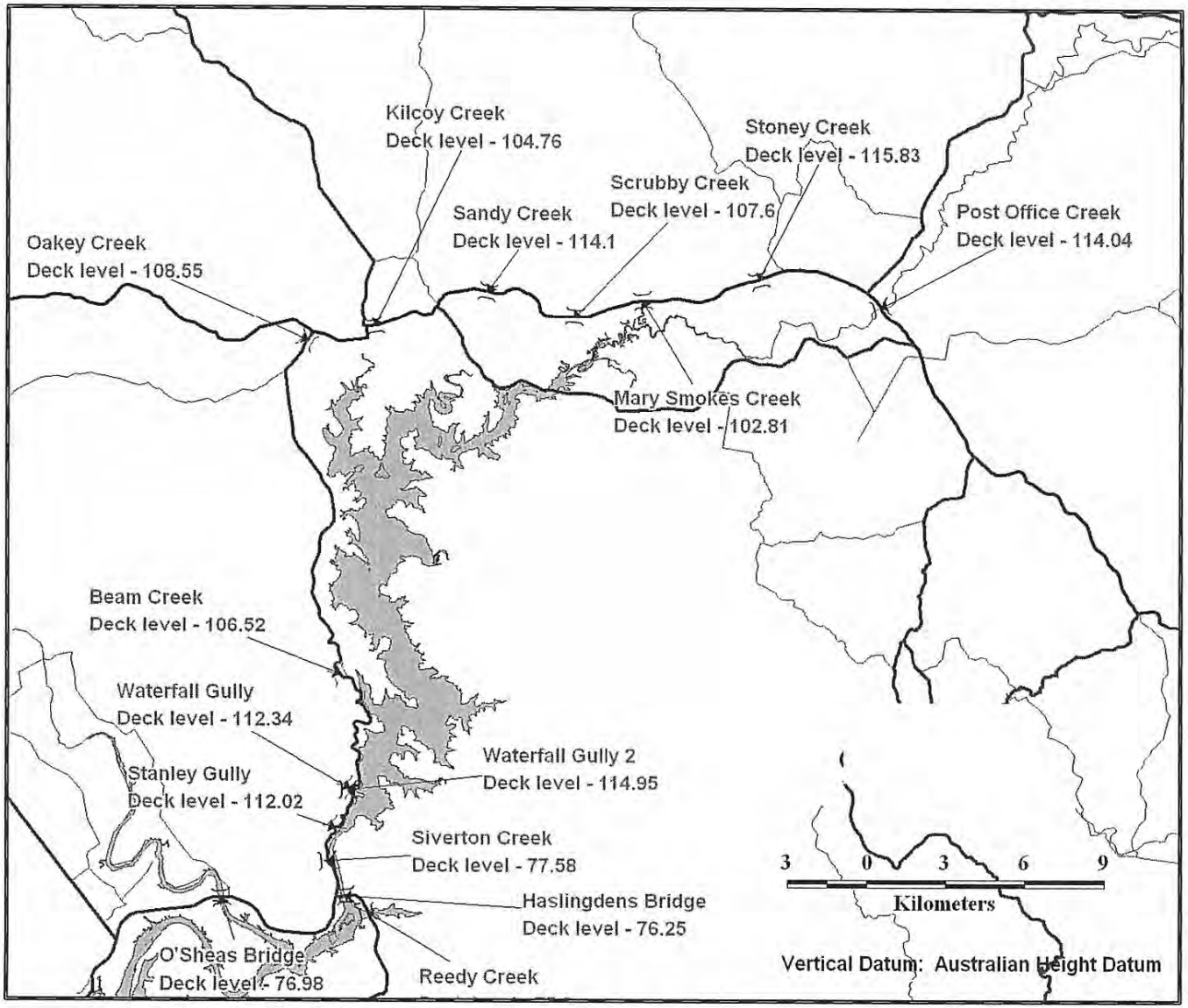

Spillway
5
4
3
2
1
HYDRO OUTLET
REGULATOR VALVE
VIEW LOOKING UPSTREAM
Main Embankment
Crest Level EL 79.10
Top of Closed Radial Gate
EL 73.00
Full Supply Level
EL 67.00
Radial Gate
Spillway Fixed Crest Level
EL 57.00
UPSTREAM
DOWNSTREAM
EL 45.00
SECTION THROUGH SPILLWAY
OUTLET WORKS :
5 Radial Gates = 12.0m x 16.6m
2 Regulator Valves = 1.5m dia
MINIMUM TIME INTERVAL
MIMUM INTERVALS FOR NORMAL OPERATION
500mm Incremental gate openings 10min
500mm Incremental gate closures 20min
Full regulator opening or closure 30min
CRITICAL LEVELS :
Saddle Dam Embankment Level = 80.00
Top of Wave Wall = 79.90
Main Embankment Crest Level = 79.10
Evaluation Design Flood Level = 77.00
Minimum Land Resumption = 75.00
Top of Closed Radial Gate = 73.00
Gate Operation Trigger Level = 67.25
Full Supply Level = 67.00
Spillway Fixed Crest Level = 57.00
SEQWC Flood Operations
WIVENHOE DAM


UPSTREAM
DOWNSTREAM
A-A
B-B
C-C
PLAN
NOTES:
1. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES
2. Levels Datum - A.H.D. (PSM 34241 = EL 74.784)
3. Contours compiled from Plan A0-42777
AS BUILT
BRISBANE RIVER 150·3km - WIVENHOE DAM
SPILLWAY
GENERAL ARRANGEMENT
16-6-78 A1-50771
CONTRACT Nº 2120
IRRIGATION AND WATER SUPPLY COMMISSION
CO-ORDINATOR GENERAL'S DEPARTMENT
A1-50771


North
SEQ WATER INFORMATION CENTRE
RELOCATE SEQ WATER ENTRANCE (STAGE 1 WORKS)
UPSTREAM SPOIL DISPOSAL AREA
EXISTING DAM EMBANKMENT
CONSTRUCT RIGHT ABUTMENT SPILLWAY (STAGE 1 WORKS)
STRENGTHEN EXISTING SPILLWAY (STAGE 1 WORKS)
UPGRADE EXISTING CRASH BARRIER NEW HEIGHT AT A MINIMUM OF RL 80.1 (STAGE 1 WORKS)
DOWNSTREAM SPOIL DISPOSAL AREA
HOLDING POND
HOLDING PONDS
LEFT HAND SIDE EMBANKMENT
HOLDING POND
DOWNSTREAM SPOIL DISPOSAL AREA
CORMORANT BAY PICNIC AREA
RAISE SADDLE DAMS TO RL 81.0 (STAGE 2 WORKS)
EXISTING SADDLE DAM 1
CONSTRUCT CLAY CUT-OFF WALL (STAGE 1 WORKS)
EXISTING SADDLE DAM 2
LEFT BANK (QUARRY) DISPOSAL AREA
HOLDING POND
CONSTRUCT SADDLE DAM 2 SPILLWAY (STAGE 2 WORKS)
BRISBANE VALLEY HIGHWAY
WIVENHOE ALLIANCE
WIVENHOE DAM UPGRADE
GENERAL
SPILLWAY AND DAM WORKS LAYOUT
WIV/DWG/CG/1000
A1

APPENDIX I
SOMERSET DAM
PLANS, MAPS AND PHOTOGRAPHS

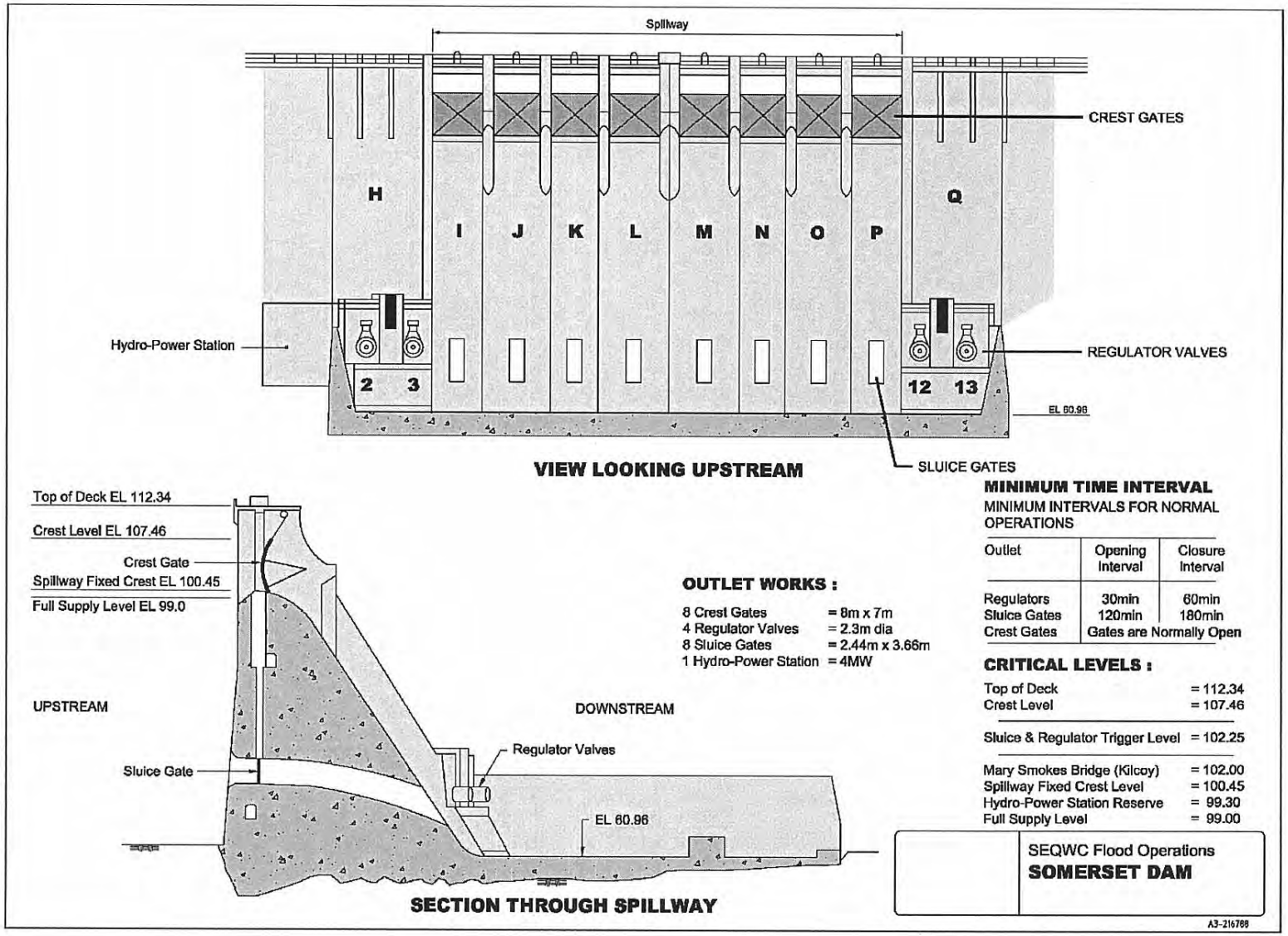
D1029

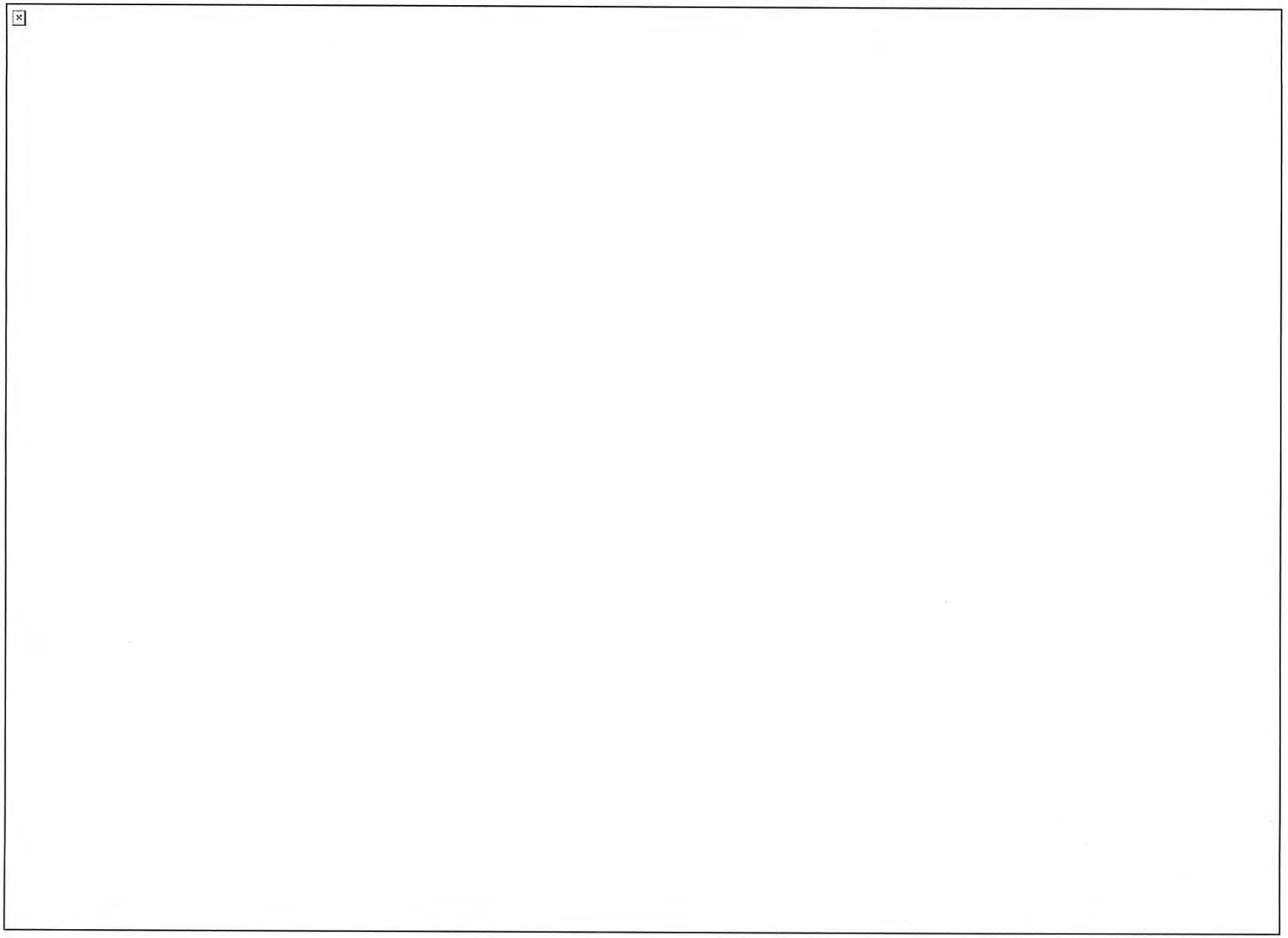

Kilcoy Creek
Deck level - 104.76
Stoney Creek
Deck level - 115.83
Scrubby Creek
Deck level - 107.6
Sandy Creek
Deck level - 114.1
Post Office Creek
Deck level - 114.04
Oakey Creek
Deck level - 108.55
Mary Smokes Creek
Deck level - 102.81
Beam Creek
Deck level - 106.52
Waterfall Gully
Deck level - 112.34
Waterfall Gully 2
Deck level - 114.95
Stanley Gully
Deck level - 112.02
Siverton Creek
Deck level - 77.58
Haslingdens Bridge
Deck level - 76.25
O'Sheas Bridge
Deck level - 76.98
Reedy Creek
3 0 3 6 9
Kilometers
Vertical Datum: Australian Height Datum

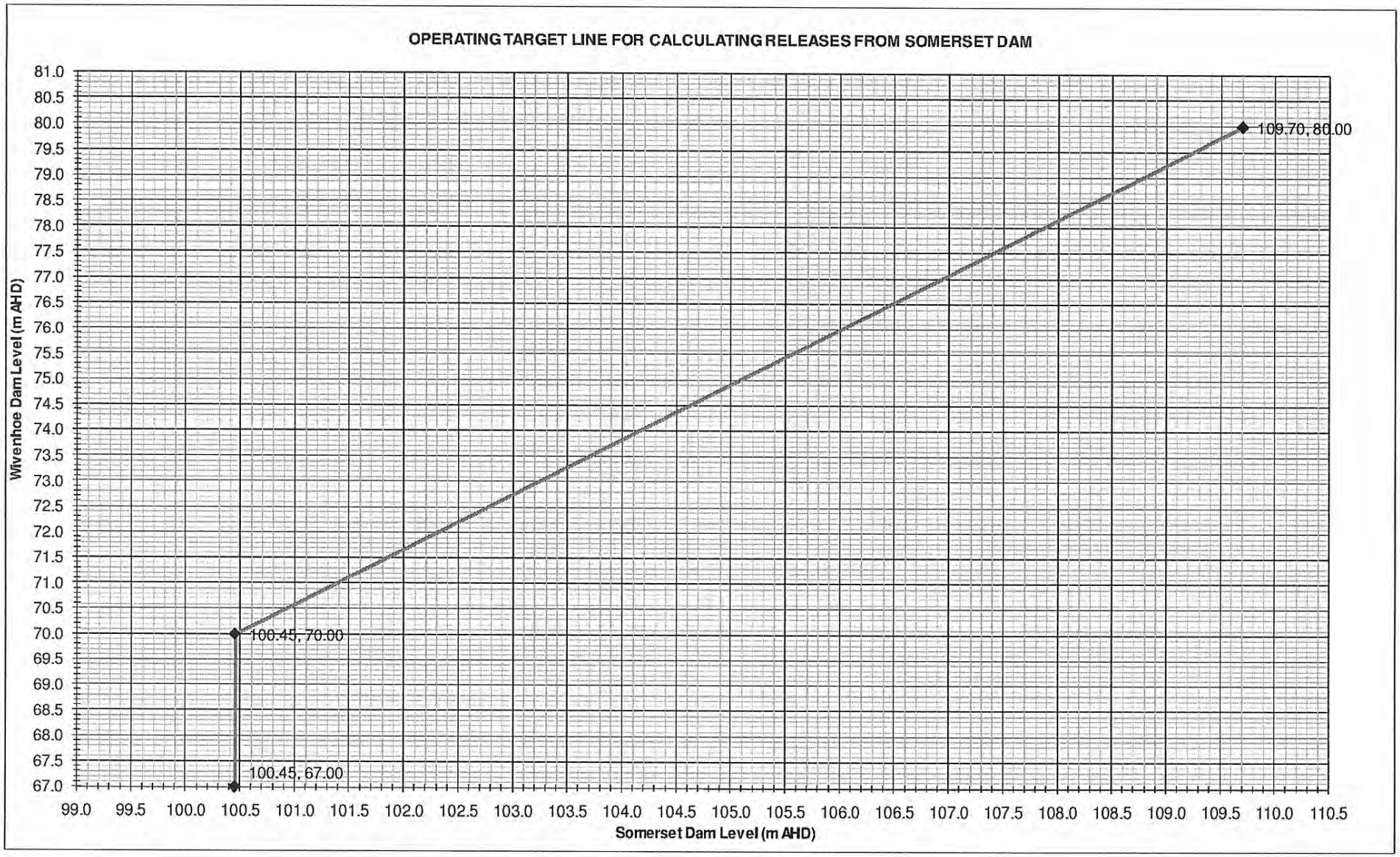
Somerset Dam



D1031


Spillway
CREST GATES
H
I
J
K
L
M
N
O
P
Q
Hydro-Power Station
REGULATOR VALVES
2
3
12
13
EL 60.96
SLUICE GATES
VIEW LOOKING UPSTREAM
Top of Deck EL 112.34
Crest Level EL 107.46
Crest Gate
Spillway Fixed Crest EL 100.45
Full Supply Level EL 99.0
UPSTREAM
DOWNSTREAM
Sluice Gate
Regulator Valves
EL 60.96
SECTION THROUGH SPILLWAY
OUTLET WORKS :
8 Crest Gates = 8m x 7m
4 Regulator Valves = 2.3m dia
8 Sluice Gates = 2.44m x 3.66m
1 Hydro-Power Station = 4MW
MINIMUM TIME INTERVAL
MINIMUM INTERVALS FOR NORMAL OPERATIONS
Outlet | Opening Interval | Closure Interval
Regulators | 30min | 60min
Sluice Gates | 120min | 180min
Crest Gates | Gates are Normally Open
CRITICAL LEVELS :
Top of Deck = 112.34
Crest Level = 107.46
Sluice & Regulator Trigger Level = 102.25
Mary Smokes Bridge (Kilcoy) = 102.00
Spillway Fixed Crest Level = 100.45
Hydro-Power Station Reserve = 99.30
Full Supply Level = 99.00
SEQWC Flood Operations
SOMERSET DAM
A3-216788




OPERATING TARGET LINE FOR CALCULATING RELEASES FROM SOMERSET DAM
Wivenhoe Dam Level (m AHD)
Somerset Dam Level (m AHD)
109.70, 80.00
100.45, 70.00
100.45, 67.00

APPENDIX J
WIVENHOE DAM – FUSE PLUG BREACH SCENARIOS

SCENARIO 1 – CENTRAL FUSE PLUG BAY INITIATED
(LEFT SIDE BAY AND RIGHT SIDE BAY INTACT)

Storage Level	Gate 1 Opening	Gate 2 Opening	Gate 3 Opening	Gate 4 Opening	Gate 5 Opening	Total Opening	Discharge	Gate Operated
m AHD	(m)	(m)	(m)	(m)	(m)	(m)	cumecs	
67.00	0.0	0.0	0.0	0.0	0.0	0.0	0	
67.75	0.0	0.0	0.5	0.0	0.0	0.5	51	3
68.25	0.0	0.0	1.0	0.0	0.0	1.0	104	3
68.65	0.0	0.0	1.5	0.0	0.0	1.5	158	3
68.80	0.0	0.0	2.0	0.0	0.0	2.0	211	3
68.95	0.0	0.0	2.5	0.0	0.0	2.5	264	3
69.25	0.0	0.0	3.0	0.0	0.0	3.0	317	3
69.40	0.0	0.0	3.5	0.0	0.0	3.5	320	3
69.55	0.0	0.5	3.5	0.0	0.0	4.0	426	2
70.00	0.0	0.5	3.5	0.5	0.0	4.5	492	4
70.30	0.0	0.5	4.0	0.5	0.0	5.0	547	3
70.60	0.0	1.0	4.0	0.5	0.0	5.5	612	2
70.70	0.0	1.0	4.0	1.0	0.0	6.0	671	4
70.90	0.5	1.0	4.0	1.0	0.0	6.5	731	1
71.10	0.5	1.0	4.0	1.0	0.5	7.0	800	5
71.20	0.5	1.5	4.0	1.0	0.5	7.5	860	2
71.40	0.5	1.5	4.0	1.5	0.5	8.0	923	4
71.60	1.0	1.5	4.0	1.5	0.5	8.5	989	1
71.70	1.0	1.5	4.0	1.5	1.0	9.0	1054	5
71.90	1.0	2.0	4.0	1.5	1.0	9.5	1120	2
72.10	1.0	2.0	4.0	2.0	1.0	10.0	1185	4
72.20	1.5	2.0	4.0	2.0	1.0	10.5	1251	1
72.40	1.5	2.0	4.0	2.0	1.5	11.0	1320	5
72.60	1.5	2.5	4.0	2.0	1.5	11.5	1396	2
72.65	1.5	2.5	4.0	2.5	1.5	12.0	1454	4
72.70	1.5	2.5	4.5	2.5	1.5	12.5	1505	3
72.75	2.0	2.5	4.5	2.5	1.5	13.0	1573	1
72.85	2.0	2.5	4.5	2.5	2.0	13.5	1634	5
72.90	2.5	2.5	4.5	2.5	2.0	14.0	1700	1
72.95	2.5	3.0	4.5	2.5	2.5	15.0	1825	5,2
73.00	2.5	3.0	4.5	3.0	2.5	15.5	1884	4
73.10	2.5	3.5	4.5	3.0	2.5	16.0	1946	2
73.20	2.5	3.5	4.5	3.5	2.5	16.5	2014	4
73.30	3.0	3.5	4.5	3.5	3.0	17.5	2139	1,5
73.40	3.0	4.0	4.5	3.5	3.0	18.0	2205	2
73.50	3.0	4.0	4.5	4.0	3.0	18.5	2266	4
73.60	3.5	4.0	5.0	4.0	3.0	19.5	2387	3,1
73.70	3.5	4.0	5.0	4.0	3.5	20.0	2462	5

D1035

73.80	3.5	4.5	5.0	4.0	3.5	20.5	2530	2
Storage Level	**Gate 1 Opening**	**Gate 2 Opening**	**Gate 3 Opening**	**Gate 4 Opening**	**Gate 5 Opening**	**Gate Openings**	**Discharge**	**Gate Operated**
m AHD	**(m)**	**(m)**	**(m)**	**(m)**	**(m)**	**(m)**	**cumecs**	
73.90	4.0	4.5	5.0	4.5	3.5	21.5	2653	4,1
74.10	4.5	4.5	5.0	4.5	4.5	23.0	2848	5,1
74.20	5.0	5.0	5.5	5.0	5.0	25.5	3147	3,2,4,1,5
74.30	5.5	5.5	6.0	5.5	5.5	28.0	3438	3,2,4,1,5
74.40	6.0	6.0	6.5	6.0	6.0	30.5	3741	3,2,4,1,5
74.50	6.5	6.5	7.0	6.5	6.5	33.0	4063	3,2,4,1,5
74.60	7.0	7.0	7.0	7.0	7.0	35.0	4280	2,4,1,5
74.70	7.5	7.5	7.5	7.5	7.5	37.5	4575	3,2,4,1,5
74.80	8.5	8.5	9.0	8.5	8.5	43.0	5240	3,2,4,1,5
74.90	9.5	9.5	10.0	9.5	9.5	48.0	5872	3,2,4,1,5
75.00	10.0	11.0	11.0	11.0	10.0	53.0	6653	3,2,4,1,5
75.10	12.0	12.0	12.0	12.0	12.0	60.0	7500	3,2,4,1,5
75.20	13.0	13.0	13.0	13.0	13.0	65.0	8265	3,2,4,1,5
75.30	13.0	13.5	13.5	13.5	13.0	66.5	8529	3,2,4
75.50	13.5	13.5	13.5	13.5	13.5	67.5	8745	1,5
≥75.70	17.5	17.5	17.5	17.5	17.5	Fully Open	10515	3,2,4,1,5

SCENARIO 2 – CENTRAL AND RIGHT SIDE FUSE PLUG BAYS INITIATED (LEFT SIDE BAY INTACT)

Storage Level	Gate 1 Opening	Gate 2 Opening	Gate 3 Opening	Gate 4 Opening	Gate 5 Opening	Total Opening	Discharge	Gate Operated
m AHD	**(m)**	**(m)**	**(m)**	**(m)**	**(m)**	**(m)**	**cumecs**	
67.00	0.0	0.0	0.0	0.0	0.0	0.0	0	
72.95	0.5	0.5	0.5	0.5	0.5	2.5	310	3,2,4,1,5
73.40	1.0	1.0	1.0	1.0	1.0	5.0	625	3,2,4,1,5
73.80	1.5	1.5	1.5	1.5	1.5	7.5	950	3,2,4,1,5
74.20	2.0	2.0	2.0	2.0	2.0	10.0	1280	3,2,4,1,5
74.60	2.5	2.5	2.5	2.5	2.5	12.5	1610	3,2,4,1,5
74.70	2.5	2.5	3.5	2.5	2.5	13.5	1740	3
74.80	3.5	3.5	3.5	3.5	3.5	17.5	2245	2,4,1,5
74.90	4.5	4.5	4.5	4.5	4.5	22.5	2860	3,2,4,1,5
75.00	6.0	6.0	6.0	6.0	6.0	30.0	3755	3,2,4,1,5
75.10	7.0	7.0	7.0	7.0	7.0	35.0	4350	3,2,4,1,5
75.20	8.5	8.5	8.5	8.5	8.5	42.5	5255	3,2,4,1,5
75.30	8.5	9.0	9.0	9.0	8.5	44.0	5453	3,2,4,
75.70	11.5	11.5	11.5	11.5	11.5	57.5	7290	3,2,4,1,5
≥76.20	17.5	17.5	17.5	17.5	17.5	Fully Open	10970	3,2,4,1,5

D1036

SCENARIO 2 – CENTRAL, RIGHT SIDE AND LEFT SIDE FUSE PLUG BAYS INITIATED (NO BAYS INTACT)

Storage Level	Gate 1 Opening	Gate 2 Opening	Gate 3 Opening	Gate 4 Opening	Gate 5 Opening	Gate Openings	Discharge	Gate Operated
m AHD	(m)	(m)	(m)	(m)	(m)	(m)	cumecs	
67.00	0.0	0.0	0.0	0.0	0.0	0.0	0	
72.95	0.5	0.5	0.5	0.5	0.5	2.5	310	3,2,4,1,5
73.40	1.0	1.0	1.0	1.0	1.0	5.0	625	3,2,4,1,5
73.80	1.5	1.5	1.5	1.5	1.5	7.5	950	3,2,4,1,5
74.20	2.0	2.0	2.0	2.0	2.0	10.0	1280	3,2,4,1,5
74.60	2.5	2.5	2.5	2.5	2.5	12.5	1610	3,2,4,1,5
75.00	3.0	3.0	3.0	3.0	3.0	15.0	1950	3,2,4,1,5
75.30	3.0	3.5	3.5	3.5	3.0	16.5	2154	3,2,4
75.40	3.5	3.5	3.5	3.5	3.5	17.5	2285	1,5
75.70	6.0	6.0	6.0	6.0	6.0	30.0	3835	3,2,4,1,5
76.20	11.5	11.5	11.5	11.5	11.5	57.5	7430	3,2,4,1,5
≥76.80	17.5	17.5	17.5	17.5	17.5	Fully Open	11530	3,2,4,1,5

D1037

APPENDIX K
BRIDGES IMPACTED BY FLOOD RELEASES AND ELEVATED STORAGE LEVELS

BRIDGES IMPACTED BY ELEVATED STORAGE LEVELS IN SOMERSET DAM			
BRIDGE NAME	**ROAD**	**BRIDGE DECK ELEVATION (m AHD)**	**LOCAL AUTHORITY**
Mary Smokes Creek	D'Aguilar Highway	102.81	Somerset Regional
Kilcoy Creek	D'Aguilar Highway	104.76	Somerset Regional
Beam Creek	Esk Kilcoy Road	106.52	Somerset Regional
Scrubby Creek	D'Aguilar Highway	107.60	Somerset Regional
Oakey Creek	Esk Kilcoy Road	108.55	Somerset Regional

D1038

BRIDGES IMPACTED BY ELEVATED STORAGE LEVELS IN WIVENHOE DAM			
BRIDGE NAME	**ROAD**	**BRIDGE DECK ELEVATION (m AHD)**	**LOCAL AUTHORITY**
Sandy Creek A&PM Conroy Bridge	Wivenhoe Somerset Road	69.61	Somerset Regional
Deep Creek	Wivenhoe Somerset Road	72.95	Somerset Regional
Kipper Creek	Wivenhoe Somerset Road	73.00	Somerset Regional
Meirs Gully	Esk Kilcoy Road	74.63	Somerset Regional
Tea Tree Creek	Brisbane Valley Highway	74.82	Somerset Regional
Logan Creek	Brisbane Valley Highway	74.88	Somerset Regional
Five Mile Creek	Brisbane Valley Highway	75.81	Somerset Regional
Reedy Creek	Wivenhoe Somerset Road	75.90	Somerset Regional
Stanley River Haslingdens Bridge	Esk Kilcoy Road	76.25	Somerset Regional
Coal Creek	Brisbane Valley Highway	76.51	Somerset Regional
Brisbane River O'Sheas Bridge	Esk Kilcoy Road	76.98	Somerset Regional
Tea Tree Gully	Brisbane Valley Highway	77.90	Somerset Regional
Middle Creek	Wivenhoe Somerset Road	78.70	Somerset Regional

D1039

BRIDGES IMPACTED BY FLOOD RELEASES FROM WIVENHOE DAM			
BRIDGE NAME	**ROAD**	**SUBMERGENCE FLOW AND BRIDGE DECK ELEVATION**	**LOCAL AUTHORITY**
Twin Bridges	Wivenhoe Pocket Road	50 m^3/s 20.0 m AHD	Somerset Regional
Savages Crossing	Banks Creek Road	130 m^3/s 20.6 m AHD	Somerset Regional
Colleges Crossing*	Mt Crosby Road	175 - 200 m^3/s -	Brisbane/Ipswich City Councils
Burtons Bridge	E Summerville Road	430 m^3/s 19.6 m AHD	Somerset Regional
Kholo Bridge	Kholo Road	550 m^3/s 11.9 m AHD	Brisbane/Ipswich City Councils
Mt Crosby Weir	Allawah Road	1900 m^3/s 12.4 m AHD	Brisbane/Ipswich City Councils
Fernvale Bridge	Brisbane Valley Highway	2000 m^3/s 33.8 m AHD	Somerset Regional

* Affected by tidal flows.

D1040

From: Bradley John [redacted]
Sent: Wednesday, January 19, 2011 9:36 AM
To: Bradley John [redacted] Barry Dennien [redacted]
Cc: Dan Spiller [redacted]
Subject: RE: Operational Procedures

Also, re the draft release – pls ensure [redacted] has a chance to review any comments made on regulatory context

John Bradley
Director-General
Department of Environment and Resource Management
[redacted]
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: Bradley John
Sent: Wednesday, 19 January 2011 9:35 AM
To: Dennien Barry @ SEQWGM
Cc: spiller daniel @ SEQWGM [redacted]
Subject: FW: Operational Procedures

Thanks Dan and Barry –

Pls have [redacted] liaise wit [redacted] n Min R's office re his needs for a draft release.

Also, pls forward me a copy of the draft comms protocol for review as soon as available.

Thanks

John Bradley
Director-General
Department of Environment and Resource Management
[redacted]
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: Dan Spiller [redacted]
Sent: Wednesday, 19 January 2011 9:29 AM
To: Bradley John
Cc: Dennien Barry @ SEQWGM
Subject: Operational Procedures

John,

Procedures as provided to us by Seqwater.

Dan

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

[redacted]

From: Barry Dennien
Sent: Wednesday, 19 January 2011 1:56 PM
To: Peter Borrows
Cc: [redacted] Dan Spiller
Subject: Re: Requested provision of dam release information to Brisbane City Council
Attachments: cidimage003.png@01CB0654.C3081F20; ATT00001.htm; cidimage008.png@01CB8736.F84905B0; ATT00002.htm

Categories: T8

Thanks Peter

Regards
Barry Dennien

On 19/01/2011, at 1:47 PM, Peter Borrows [redacted] wrote:

> Barry – further to our earlier discussion, I confirm that the Brisbane City Council (BCC) requested dam release information is best contained in the Technical Situation Reports (TSR) that Seqwater provided to the Grid Manager pursuant to the *Protocol for the Communication of Flooding Information for the Brisbane River Catchment including Flood Releases from Wivenhoe and Somerset Dams* (Protocol). Rob Drury has confirmed that he consulted with BCC about proposed releases but did not provide the TSRs directly to BCC. Seqwater has no objection to the provision to Brisbane City Council of Technical Situation Reports that were supplied to the Grid Manager during the event.
>
> Regards, Peter.
>
> **Peter Borrows**
>
> Chief Executive Officer
>
> Queensland Bulk Water Supply Authority *trading as* Seqwater

[redacted]

From: WaterGridMedia[redacted]
Sent: Monday, 17 January 2011 3:34 PM
To: [redacted]
Subject: Media enquiry - Wivenhoe Dam

Categories: T8

[redacted]

Thank you for your enquiry.

As you may be aware, a Royal Commission has been announced into the Queensland floods. Given this announcement, we are currently awaiting formal legal advice on our ability to respond to your request.

We will advise in due course.

Regards,
Water Grid Communications

[redacted]
www.watergrid.com.au

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

[redacted]

From: WaterGridMedia [redacted]
Sent: Monday, 17 January 2011 3:35 PM
To: [redacted]
Subject: Media enquiry - Wivenhoe Dam

Categories: T8

Hi [redacted]

Thank you for your enquiry.

As you may be aware, a Royal Commission has been announced into the Queensland floods. Given this announcement, we are currently awaiting formal legal advice on our ability to respond to your request.

We will advise in due course.

Regards,
Water Grid Communications
[redacted]
www.watergrid.com.au

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

[redacted]

From: WaterGridMedia [redacted]
Sent: Monday, 17 January 2011 3:40 PM
To: [redacted]
Subject: RE: Qld Times Ipswich enquiry

Categories: T8

Hi [redacted]

Thank you for your enquiry.

As you may be aware, a Royal Commission has been announced into the Queensland floods. Given this announcement, we are currently awaiting formal legal advice on our ability to respond to your request.

We will advise in due course.

Regards,
Water Grid Communications
[redacted]
www.watergrid.com.au

From: [redacted]
Sent: Monday, 17 January 2011 9:56 AM
To: WaterGridMedia
Subject: Qld Times Ipswich enquiry
Importance: High

Hi [redacted] from the Qld Times in Ipswich here - just have a few questions.
Looking for a response by 4pm this afternoon.

1/ Just a response to the comments by an engineer in today's edition of The Australian - were water releases too low on Jan 7-9 before the large rain event or was it sufficient given no one know how severe the rain/conditions would be last week?
2/ Are the releases / current capacity at a good safe level?
3/ Colleges Crossing, which is often closed when there are large water gate releases from the Wivenhoe, was able to open very briefly about Christmas Eve/Christmas Day before shutting it again. Could more releases have been made about this time?
4/ How long do you expect to be releasing water from the Wivenhoe Dam for?

Thanks for your help,

[redacted]
Journalist
The Queensland Times
260 Brisbane Street | West Ipswich | QLD | 4305
[redacted]
www.qt.com.au

Notice This email and any attachments are strictly confidential and subject to copyright. They may contain privileged information. If you are not the intended recipient please delete the message and notify the sender. You should not read, copy, use, change, alter or disclose this email or its attachments without authorisation. The company and any related or associated companies do not accept any liability in connection with this email and any attachments including in connection with computer viruses, data corruption, delay, interruption, unauthorised access or unauthorised amendment. Any views expressed in this email and any attachments do not necessarily reflect the views of the company or the views of any of our related or associated companies.

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

[redacted]

From: [redacted]
Sent: Monday, 17 January 2011 4:02 PM
To: Peter Borrows; Barry Dennien
Cc: Dan Spiller; Allen Peter; Rob Drury; John Tibaldi; Jim Pruss
Subject: RE: Australian Questions 17-Jan & [redacted]

Categories: T8

Hi Peter

I suggest that we incorporate into theses answers, where relevant, the flood capacity value which we actually reached i.e 191% (I think) You could also think about including the rate of increase, expressed in these terms, in the peak inflow events on Tuesday. Taken together, these two figures demonstrate that the dam was being operated appropriately, given the circumstances.

Regards

[redacted]

From: Peter Borrows [redacted]
Sent: Monday, 17 January 2011 2:46 PM
To: Dennien Barry @ SEQWGM
Cc: spiller daniel @ SEQWGM; Reilly Bob; Allen Peter; Rob Drury; John Tibaldi; Jim Pruss
Subject: FW: Australian Questions 17-Jan & [redacted]

Barry.

First 4 questions are answers to [redacted]

The rest are the Australian.

Regards, Peter.

Peter Borrows
Chief Executive Officer
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au



From: John Tibaldi
Sent: Monday, 17 January 2011 2:36 PM
To: Peter Borrows

[redacted]

Subject: Australian Questions 17-Jan (subject to BOM confirmation on one number)

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

+--+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+--+

[redacted]

From: [redacted]
Sent: Monday, 17 January 2011 4:17 PM
To: Peter Borrows; [redacted]; Barry Dennien; Jim Pruss
Cc: Rob Drury; John Tibaldi; [redacted] Dan Spiller; [redacted]
Subject: FW: Australian Questions 17-Jan & [redacted]
Attachments: Australian Questions 17-Jan with answers.doc

Categories: T8

Pete,

The Water Grid has advised that due to the Premier's announcement of a Royal Commission the Grid will not be providing a response to the Australian pending legal advice.

Cheers [redacted]

From: Rob Drury
Sent: Monday, 17 January 2011 3:32 PM
To: Mike Foster
Subject: Fw: Australian Questions 17-Jan & Mr O'Brien

From: Peter Borrows
To: [redacted]
Cc: [redacted] Rob Drury; John Tibaldi; Jim Pruss
Sent: Mon Jan 17 14:46:18 2011
Subject: FW: Australian Questions 17-Jan & Mr O'Brien

Barry.

First 4 questions are answers to Mr O'Brien.

The rest are the Australian.

Regards, Peter.

Peter Borrows
Chief Executive Officer
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

[redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au



From: John Tibaldi
Sent: Monday, 17 January 2011 2:36 PM
To: Peter Borrows
Cc [redacted]
Subject: Australian Questions 17-Jan (subject to BOM confirmation on one number)

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

JANUARY 2011 FLOOD EVENT
QUESTIONS AND ANSWERS

Why did Seqwater not allow the total available flood storage capacity of Wivenhoe to be utilised during this period?

- Wivenhoe Dam is not designed to overtop. If it did, the dam would fail and the resulting damage and loss of life would be at least 100 to 1,000 times greater than that currently being experienced.
- To ensure that this never occurs, the dam has been designed with fuse plugs that automatically open when it reaches more than 200% of full supply volume.
- Once triggered, the rate of release through these plugs cannot be varied.
- The plugs continue to release water at this rate until the dam reaches full supply level.
- The fuse plugs would take four to six months of dry weather to repair, and severely restrict the capability to manage further flood events during this period.
- Flood operations were managed to ensure a buffer below 200% to allow for possibilities of further extensive inflows to ensure that the dam does not fail.

What justification was there for the substantial increase in discharge from Wivenhoe to 645,000ML/d when a release rate of 215,000ML/d has been demonstrably sufficient to stop the levels in Wivenhoe rising and while there remained substantial capacity in Wivenhoe for additional flood storage?

At the peak of the event a discharge rate of 215,000ML/d would not have been sufficient to stop the levels in Wivenhoe rising.

The reasons why the remaining flood storage capacity in Wivenhoe Dam was not used at the peak of the event are contained in the answer to the previous question.

Was this increase to 645,000ML/d the sole reason for the significant flooding in Brisbane?

The Bureau of Meteorology has stated that, even at their peak, outflows from Wivenhoe Dam contributed slightly more than half the flood arriving in Brisbane (Courier Mail, 14 January). Seqwater agrees with this assessment.

Based on the fact that the current event was one meter lower than the 1974 event, BOM and Seqwater have agreed that the flow in the Lower Brisbane River at the peak of the event was in the order of 690,000ML/d. Accordingly outflows from Wivenhoe Dam contributed around 350,000ML/d to the total flow at this time. The difference between this flow and the peak outflow from Wivenhoe Dam during the event is due to attenuation effects along the length of the river as would be expected in such an event.

Why did it initially take SEQWater 6 days to respond to the gradually increasing water levels in Wivenhoe which reduced its flood control capacity?

Seqwater responded immediately to increases in storage level by commencing releases from Wivenhoe Dam at the commencement of the flood event. When managing a flood event using Wivenhoe Dam, the primary objectives in order of importance are:

- Ensure the structural safety of the dams;
- Provide optimum protection of urbanised areas from inundation;
- Minimise disruption to rural life in the valleys of the Brisbane and Stanley Rivers. Primarily this involves minimising inundation of the seven bridges below the dam upstream of Moggill.

The most recent four flood events (commencing October 2011), demonstrate the importance of following these objective to minimise overall downstream flood impacts.

Why did Seqwater permit the flood storage capacity to build up so much over the weekend?

Seqwater commenced releases from Wivenhoe Dam at the start of the flood event on 7 January 2011. When managing a flood event using Wivenhoe Dam, the primary objectives in order of importance are:

- Ensure the structural safety of the dams;
- Provide optimum protection of urbanised areas from inundation;
- Minimise disruption to rural life in the valleys of the Brisbane and Stanley Rivers. Primarily this involves minimising inundation of the seven bridges below the dam upstream of Moggill.

The most recent four flood events (commencing October 2011), demonstrate the importance of following these objective to minimise overall downstream flood impacts.

Why did Seqwater not release significantly greater volumes on Friday, Saturday and Sunday, prior to the freak rainfall event on Monday over the Toowoomba escarpment?

No agency or person was able to forecast the freak rainfall event on Monday over the Toowoomba escarpment prior to it occurring. Therefore it was not possible to ramp up releases to cater for this freak event before it actually occurred.

What does Seqwater say to the suggestion that its strategy to limit the releases on the weekend meant its storage buffer was limited, necessitating a massive outflow on Tuesday of 645,000 megalitres?

The peak outflow that occurred for three hours of 645,000 ML/d (total volume of 80,625 megalitres) does not reflect the impact at Brisbane due to the attenuation effects of the river. The Bureau of Meteorology has stated that, even at their peak, outflows from Wivenhoe Dam contributed slightly more than half the flood arriving in Brisbane (Courier Mail, 14 January). Seqwater agrees with this assessment.

Based on the fact that the current event was one meter lower than the 1974 event, BOM and Seqwater have agreed that the flow in the Lower Brisbane River at the peak of the event was in the order of 690,000ML/d. Accordingly outflows from Wivenhoe Dam contributed around 350,000ML/d to the total flow at this time. The difference between this flow and the peak outflow from Wivenhoe Dam during the event is due to attenuation effects along the length of the river as would be expected in such an event.

What does Seqwater say to the suggestion that this 645,000 megalitres release was responsible for more than 80 per cent of the peak flow rate (which you advised me last Friday was about 9000 cubic metres per second in Brisbane)?

The Bureau of Meteorology has stated that, even at their peak, outflows from Wivenhoe Dam contributed slightly more than half the flood arriving in Brisbane (Courier Mail, 14 January). Seqwater agrees with this assessment.

Based on the fact that the current event was one meter lower than the 1974 event, BOM and Seqwater have agreed that the flow in the Lower Brisbane River at the peak of the event was in the order of 690,000ML/d. Accordingly outflows from Wivenhoe Dam contributed around 350,000ML/d to the total flow at this time. The difference between this flow and the peak outflow from Wivenhoe Dam during the event is due to attenuation effects along the length of the river as would be expected in such an event.

What does Seqwater say to the suggestion that its delay in responding to the increasing water levels at Wivenhoe forced its management to take rash action on Tuesday, which produced the flood in Brisbane?

No rash action was taken at any time during the flood event in managing releases from Wivenhoe Dam. Wivenhoe dam reduced flood levels in Brisbane by up to 2.5 metres in Brisbane city and a metre from the BOM peak flood level forecast. This was achieved by following carefully considered objectives and procedures.

Seqwater commenced releases from Wivenhoe Dam at the start of the flood event on 7 January 2011. When managing a flood event using Wivenhoe Dam, the primary objectives in order of importance are:

- Ensure the structural safety of the dams;
- Provide optimum protection of urbanised areas from inundation;
- Minimise disruption to rural life in the valleys of the Brisbane and Stanley Rivers. Primarily this involves minimising inundation of the seven bridges below the dam upstream of Moggill.

The most recent four flood events (commencing October 2011), demonstrate the importance of following these objective to minimise overall downstream flood impacts.

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Monday, 17 January 2011 5:02 PM
To: [redacted] Jim Pruss;
Cc: [redacted]
Subject: [redacted]
Attachments: Technical_Situation_Report_W60.docx

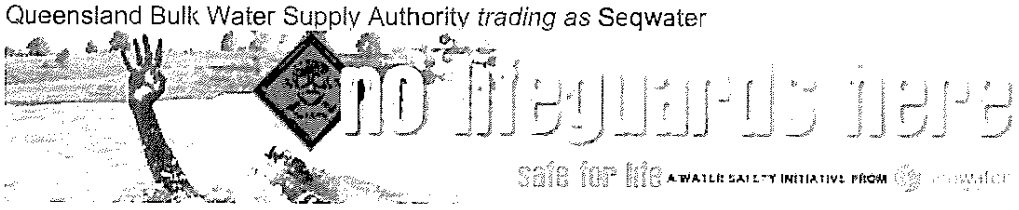
Attached Technical Report W60.

Somerset is almost at FSL using a cone valve and closing of gates at Wivenhoe started at 2pm today and will be fully closed early Thursday morning.

Discussions with BCC highlighted some concerns re bank slumping along Coronation drive. Although not quantified, they requested a close down Thursday instead of Wednesday as previously planned to give more time. They also requested a close down no later than Thursday to avoid any issues with predicted high tides towards the weekend. This can be achieved and a close down Thursday morning is now planned.

North Pine closed.

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.

seqwater
WATER FOR LIFE

[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W60	Date of TSR release	17.1.2011	Time of TSR release	4pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Draw Wivenhoe Dam down to FSL by around Thursday morning.	
Strategy	• Somerset just using valves to reach FSL • Drain Wivenhoe to FSL by Thursday	
Key considerations	Storage levels:	Above FSL
	Inflows:	Total event inflows expected around 2,600,000ML.
	Rainfall:	Minimal
	Lockyer/Bremer:	Monitoring
	Brisbane River:	Impact as below.

Rainfall

There has been no significant rainfall in the last 24 hours and no significant rainfall is expected in the next twenty-four hours. Mostly fine conditions are expected over the weekend, but showers will return early next week.

Somerset/Wivenhoe

Somerset Dam peaked at 105.11 mAHD at 06:00 on 12 January 2011.

At 4pm Somerset was 99.02m and 380,700ML at 100.2% and discharging through cone valves. All sluices are shut.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

At 4pm Wivenhoe Dam was 68.66 m AHD at 1,352,706ML and 116.1% and dropping. The closing sequence started at 2pm today and releases will be slowly decreased through gate closures over the next few days to reach FSL around Thursday morning. The releases from Wivenhoe Dam are currently about 2946 m3/

Discussions with BCC indicated they would prefer a Thursday closure to increase release time and minimize possible impacts re slumping along Coronation Drive. They also would like closure no later than Thursday prior to predicted high tides late this week.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

North Pine

North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

At 4pm North Pine Dam was 39.54mAHD and 213,024ML and 99.4% and all gates were closed. The current level is expected to increase to stay around this level. This could be higher if further rainfall occurs.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels throughout the Brisbane and Pine River catchments and is maintaining close contact with warning agencies and local councils.

Councils have been informed of the current release strategy. The bridges below Wivenhoe Dam will progressively come out of water over the next few days.

Leslie Harrison Dam:
Gates closed.

Hinze Dam:
A minor release is being made from Hinze Dam through the emergency gates. The Lake Level is dropping and the gate will be closed Tuesday. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	18.1.2011	Time	9am	or Event	

[redacted]

From: SEQWGM Media
Sent: Tuesday, 18 January 2011 5:47 PM
To: Dan Spiller
Cc: [redacted]

Categories: T8

Hi Dan, please see below the two relevant responses, which I will confirm with [redacted] if ok.

The dam spillway was upgraded in 2007, increasing its release capacity in extreme floods. This upgrade is designed to ensure the structural integrity of the dam during floods significantly worse than the current event.

A further upgrade of the spillway is scheduled to occur by 2035, in order to comply with ANCOLD upgrade. This upgrade is for even more extreme floods. It would have had no impact on the management of the current flood.

[redacted]

Sent from my iPhone

[redacted]

From: SEQWGM Media
Sent: Tuesday, 18 January 2011 6:08 PM
To: [redacted]
Cc: [redacted] Dan Spiller
Subject: Response - the Australian

Categories: T8

[redacted]

Please find below the response to the Australian, approved by Seqwater and SEQ Water Grid Manager.

> The dam spillway was upgraded over 2006 and 2007, increasing its release capacity in extreme floods. This upgrade is designed to ensure the structural integrity of the dam during floods significantly worse than the current event.

> A further upgrade of the spillway is scheduled to occur by 2035, in order to comply with ANCOLD upgrade. This upgrade is for even more extreme floods. It would have had no impact on the management of the current flood.

Kindest Regards

[redacted]

Sent from my iPhone

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Tuesday, 18 January 2011 6:50 AM
To: Rob Drury; Dan Spiller; Peter Borrows; [redacted] Jim Pruss;
Cc: [redacted]
Subject: RE: Technical Report W61
Attachments: Technical_Situation_Report_W61.docx

Attached Report W61.

Still aiming for final closure Thursday morning.

Releases slowed over night to assist water supply pumping at Lowood but recommencing this morning.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.



[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W61	Date of TSR release	18.1.2011	Time of TSR release	6am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Draw Wivenhoe Dam down to FSL by around Thursday morning.	
Strategy	• Somerset just using valves for releases • Drain Wivenhoe to FSL by Thursday	
Key considerations	Storage levels:	Above FSL
	Inflows:	Total event inflows expected around 2,600,000ML.
	Rainfall:	Minimal
	Lockyer/Bremer:	Monitoring
	Brisbane River:	Impact as below.

Rainfall

There has been no significant rainfall in the last 24 hours and no significant rainfall is expected in the next twenty-four hours. Mostly fine conditions are expected over the weekend, but showers will return early next week.

Somerset/Wivenhoe

Somerset Dam peaked at 105.11 mAHD at 06:00 on 12 January 2011.

At 6am Somerset was 98.98m and 379,016ML at 99.8% and discharging through one cone valve. All sluices are shut.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

At 6am Wivenhoe Dam was 67.82 m AHD at 1,255,638ML and 107.8% and dropping.

Releases were held constant overnight at about 2,050 m3/s to assist water supply pumping at Lowood. Following discussions with water supply operators, it has been decided to resume closing gates at 09:00 Tuesday before final closure on Thursday morning. The Dam will be near full supply and releases will be made through the regulator to account for ongoing base-flow.

Discussions with BCC indicated they would prefer a Thursday closure to increase release time and minimize possible impacts re slumping along Coronation Drive. They also would like closure no later than Thursday prior to predicted high tides late this week.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

It should be noted that the Seqwater water level gauge currently being reported on the BoM website is currently slightly under reading by about 50mm.

North Pine

North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

North Pine Dam is still around 39.54mAHD and 213,024ML and 99.4% and all gates were closed. The current level is expected to increase to stay around this level. This could be higher if further rainfall occurs.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels throughout the Brisbane and Pine River catchments and is maintaining close contact with warning agencies and local councils.

Councils have been informed of the current release strategy. The bridges below Wivenhoe Dam will progressively come out of water over the next few days.

Leslie Harrison Dam:
Gates closed.

Hinze Dam:
A minor release is being made from Hinze Dam through the emergency gates. The Lake Level is dropping and the gate will be closed today. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths af inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based an the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	19.1.2011	Time	9am	or Event	

[redacted]

From: SEQWGM Media
Sent: Tuesday, 18 January 2011 6:51 PM
To: [redacted] Dan Spiller
Subject: Fwd: Floods- Wivenhoe The Australian 180111.doc

Categories: T8

Hi all,

Please see below the amended response for the Australian for our consideration.

[redacted] would you please let me know if Seqwater approves the below response?

Same from [redacted] and Dan?

Thanks
[redacted]

Sent from my iPhone

Begin forwarded message:

> **From:** [redacted]
> **Date:** 18 January 2011 6:45:36 PM GMT+10:00
> [redacted] aterGridMedia [redacted]
> **Subject: Floods- Wivenhoe The Australian 180111.doc**
>
> Words in response to the Oz for your consideration:
>
> The first upgrade of the Wivenhoe Dam spillway was in 2006/2007 which increased its release capacity in extreme floods.
> A further upgrade of the spillway is not scheduled to be completed until 2035. That upgrade would allow the dam to manage floods even more extreme than last week's event.
>
> Regards,
>
> [redacted]
>
> Assistant Media Advisor
> Office of the Hon. Stephen Robertson MP
> Minister for Natural Resources, Mines and Energy and Minister for Trade
> [redacted]

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and /or publication of this email is also prohibited.

Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.

Please consider the environment before printing this email.

[redacted]

From: [redacted]
Sent: Tuesday, 18 January 2011 7:09 PM
To: [redacted]
Cc: SEQWGM Media; Dan Spiller
Subject: Re: Floods- Wivenhoe The Australian 180111.doc

Categories: T8

OK with me

From: [redacted]
To: [redacted]
Cc: SEQWGM Media [redacted]
Sent: Tue Jan 18 19:05:11 2011
Subject: Re: Floods- Wivenhoe The Australian 180111.doc

Ok here- dan [redacted] will send out once approved.

Sent from my iPhone

On 18/01/2011, at 7:56 PM, "[redacted] wrote:

OK

From: SEQWGM Media [redacted]
To: [redacted] Dan Spiller [redacted]
Sent: Tue Jan 18 18:51:08 2011
Subject: Fwd: Floods- Wivenhoe The Australian 180111.doc

Hi all,

Please see below the amended response for the Australian for our consideration.

Paul would you please let me know if Seqwater approves the below response?

Same from Mike and Dan?

Thanks

[redacted]

Sent from my iPhone

Begin forwarded message:

From [redacted]
Date: 18 January 2011 6:45:36 PM GMT+10:00
To: SEQWGM Media [redacted] WaterGridMedia [redacted]

[redacted]

Subject: Floods- Wivenhoe The Australian 180111.doc

Words in response to the Oz for your consideration:

The first upgrade of the Wivenhoe Dam spillway was in 2006/2007 which increased its release capacity in extreme floods.
A further upgrade of the spillway is not scheduled to be completed until 2035. That upgrade would allow the dam to manage floods even more extreme than last week's event.

Regards

[redacted]

Assistant Media Advisor
Office of the Hon. Stephen Robertson MP
Minister for Natural Resources, Mines and Energy and Minister for Trade

[redacted]

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and /or publication of this email is also prohibited.

Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.

Please consider the environment before printing this email.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
--
Your Anti-virus Service scanned this email. It is safe from known viruses.

For more information regarding this service, please contact your service provider.

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network. If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.
----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

From: Dan Spiller [redacted]
Sent: Tuesday, January 18, 2011 9:27 AM
To: 'Bradley John' [redacted]
Cc: Barry Dennien [redacted] 'Best Debbie' [redacted]; 'Rob Drury' [redacted]
Subject: Update on releases
Attach: Technical_Situation_Report_W61.docx

Current Technical Situation Report for information.

Somerset Dam is at 99.8% of capacity and Wivenhoe Dam at 107.8%.

Seqwater advises that releases from Wivenhoe Dam were held constant overnight at about 2,050 cubic metres per second to assist water supply pumping at Lowood. Gate closure will resume at 09:00 Tuesday before final closure on Thursday morning. The dam will be near full supply and releases will be made through the regulator to account for ongoing base-flow.

The strategy was developed in consultation with BCC, which indicated that it would prefer a Thursday closure to increase release time and minimize possible impacts in relation to slumping along Coronation Drive. BCC also advises operators that they also would like closure no later than Thursday prior to predicted high tides late this week.

Please call me or [redacted] if you require any further information.

Regards,
Daniel Spiller

TECHNICAL SITUATION REPORT

TSR Number	W61	Date of TSR release	18.1.2011	Time of TSR release	6am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Draw Wivenhoe Dam down to FSL by around Thursday morning.	
Strategy	• Somerset just using valves for releases • Drain Wivenhoe to FSL by Thursday	
Key considerations	Storage levels:	Above FSL
	Inflows:	Total event inflows expected around 2,600,000ML.
	Rainfall:	Minimal
	Lockyer/Bremer:	Monitoring
	Brisbane River:	Impact as below.

Rainfall

There has been no significant rainfall in the last 24 hours and no significant rainfall is expected in the next twenty-four hours. Mostly fine conditions are expected over the weekend, but showers will return early next week.

Somerset/Wivenhoe

Somerset Dam peaked at 105.11 mAHD at 06:00 on 12 January 2011.

At 6am Somerset was 98.98m and 379,016ML at 99.8% and discharging through one cone valve. All sluices are shut.

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

At 6am Wivenhoe Dam was 67.82 m AHD at 1,255,638ML and 107.8% and dropping.

Releases were held constant overnight at about 2,050 m3/s to assist water supply pumping at Lowood. Following discussions with water supply operators, it has been decided to resume closing gates at 09:00 Tuesday before final closure on Thursday morning. The Dam will be near full supply and releases will be made through the regulator to account for ongoing base-flow.

Discussions with BCC indicated they would prefer a Thursday closure to increase release time and minimize possible impacts re slumping along Coronation Drive. They also would like closure no later than Thursday prior to predicted high tides late this week.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

It should be noted that the Seqwater water level gauge currently being reported on the BoM website is currently slightly under reading by about 50mm.

North Pine

North Pine peaked at 41.11 mAHD at 14:00 on 11 January 2011 with peak release of 2,800 m3/s. The event has a volume of around 200,000 ML

North Pine Dam is still around 39.54mAHD and 213,024ML and 99.4% and all gates were closed. The current level is expected to increase to stay around this level. This could be higher if further rainfall occurs.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels throughout the Brisbane and Pine River catchments and is maintaining close contact with warning agencies and local councils.

Councils have been informed of the current release strategy. The bridges below Wivenhoe Dam will progressively come out of water over the next few days.

Leslie Harrison Dam:
Gates closed.

Hinze Dam:
A minor release is being made from Hinze Dam through the emergency gates. The Lake Level is dropping and the gate will be closed today. There is no public access to the spillway.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths of inundation based an the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the informatian)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	19.1.2011	Time	9am	or Event	

[redacted]

From: WaterGridMedia[redacted]
Sent: Tuesday, 18 January 2011 11:53 AM
Subject: WATER GRID MEDIA UPDATE - 18 January 2011

Categories: T8: Media

WATER GRID MEDIA UPDATE

18 January 2011, 11.45am

GATE CLOSURE COMMENCED AT WIVENHOE DAM

NOTE: All SEQ dams remain safe, stable and operating within their design specifications.

Wivenhoe Dam is at 107 per cent and continues to drop steadily. Releases remained constant overnight at around 176,000 megalitres per day and are now reducing with the commencement of the gate closing sequence which began at 9am this morning.

The five radial gates are expected to be shut by Thursday to allow for the high tides that have been predicted for later this week. Subject to weather, it is expected that the dam's flood storage compartment will have been returned to near zero from Thursday with any smaller excesses discharged via a smaller cone valve.

Inflows and water levels continue to be monitored in the Brisbane and Pine catchments.

Somerset Dam is at 99 per cent with small discharges through the cone valves into Wivenhoe. All sluice gates at Somerset are closed.

Releases are being made in consultation with the Bureau of Meteorology and local councils and every effort is being made to limit downstream impacts where possible.

Residents are urged to contact local councils for detailed information on road crossing closures and other impacts.

Recreation areas around Somerset and Wivenhoe remain closed until further notice due to safety. People are advised not to travel to any recreation sites during the flood situation, even if the roads are open.

North Pine Dam is at 99 per cent and all five gates remain closed.

The gates at Hinze Dam closed this morning.

For detailed information on river levels, road and crossing closures and other potential impacts, always contact your local council.

A single dam update will now be issued mid-morning each day.

WATER QUALITY

Water across Brisbane and the Sunshine and Gold Coasts remains safe to drink. Water Grid suppliers are continually monitoring water quality across the network as well working closely with Queensland Health.

While Queensland Urban Utilities have a precautionary Boiled Water Alert currently in place for Marburg, water in the Ipswich area is also safe to drink.

Boil water alerts are in place for locations in the Lockyer Valley and Somerset council areas and residents and businesses are urged to visit the Queensland Urban Utilities website www.urbanutilities.com.au for more details.

ENDS

Owing to technical issues caused by the flood, a temporary email contact is in use. Please email to watergridmedia@linkwater.com.au

Community Assistance

Please direct the community to contact telephone - 1800 613 122. This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.
Members of the public seeking information on potential impacts in their local areas should direct inquiries to their local councils.

About the SEQ Water Grid

Established in June 2008, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure and is a world class asset in water management in both times of drought and deluge.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Mobile: 0458 249 365
Email: watergridmedia@linkwater.com.au

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

[redacted]

From: SEQWGM Media
Sent: Tuesday, 18 January 2011 8:11 PM
Subject: Media alert: WATER GRID CONTINUES TO SUPPORT CLEAN-UP WITH PURIFIED RECYCLED WATER

Categories: T8: Media

Media alert
18 January 2011

WATER GRID CONTINUES TO SUPPORT CLEAN-UP WITH PURIFIED RECYCLED WATER

Councils and other government employees and contractors involved in flood-clean-up operations can now access clean wash-down water from the Western Corridor Recycled Water Project.

Water tankers can collect purified recycled water from the Western Corridor Recycled Water Project at the following locations from 7am to 5pm daily:

- Bundamba Advanced Water Treatment Plant - 142 River Road Bundamba (cnr of River Road and Hanlon St)
- Gibson Island Advanced Water Treatment Plant - 178 Paringa Rd, Murarrie (next to Visy Paper)
- Lowood Pump Station - Noland St, Lowood

The water is suitable for the wash-down of roads, surfaces and other articles contaminated by flood residue.

The provision of free wash-down water is just one of the ways the SEQ Water Grid is helping to manage and minimise the impact of last week's flooding and to ensure safe, secure water supplies for South East Queensland.

ENDS

Litsupport Brisbane

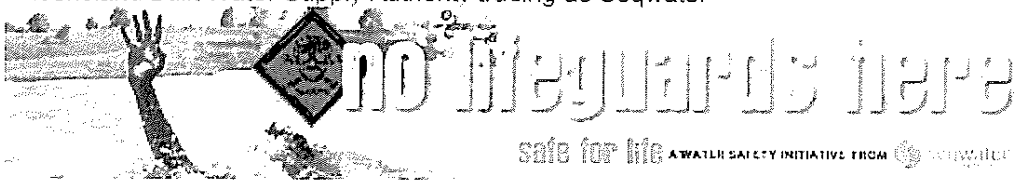
From: Rob Drury [redacted]
Sent: Wednesday, 19 January 2011 7:09 AM
To: Rob Drury; Dan Spiller; Peter Borrows; [redacted] Jim Pruss; [redacted]
Cc: [redacted]
Subject: RE: Technical Report W62
Attachments: Technical_Situation_Report_W62.docx

Attached report W62.

Main changes are related to holding a higher release rate for some hours over night due to Lowood water access issues. Also we intend to close down today sometime rather than tomorrow morning partly for same reason and also as BCC no longer has concerns re Coro Drive.
This also means final level for Wivenhoe may be between 95% and 99%, with some ongoing base flows that may bring it back up slightly.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.



[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

From: Rob Drury
Sent: Tuesday, 18 January 2011 6:50 AM
To: Rob Drury; 'Dan Spiller'; Peter Borrows; [redacted] Jim Pruss; [redacted]
Subject: RE: Technical Report W61

Attached Report W61.

Still aiming for final closure Thursday morning.

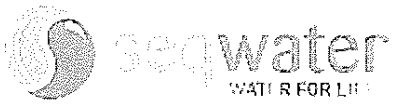
Releases slowed over night to assist water supply pumping at Lowood but recommencing this morning.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.



[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W62	Date of TSR release	19.1.2011	Time of TSR release	6am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Close all gates on Wivenhoe Dam by this afternoon.	
Strategy	• Somerset closed down. • Continue closing releases at Wivenhoe.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Total event inflows expected around 2,600,000ML.
	Rainfall:	Some storms overnight
	Lockyer/Bremer:	Monitoring
	Brisbane River:	Impact as below.

Rainfall

Severe thunderstorms passed over the Wivenhoe, Somerset and North Pine dam catchments yesterday afternoon and evening. Falls of 20mm to 30mm where recorded at isolated locations, however not causing any real inflows except at North Pine Dam..

Somerset/Wivenhoe

Somerset Dam peaked at 105.11 mAHD at 06:00 on 12 January 2011.

At 6.30am Somerset was 99.00m and 379,849ML at 100.0% and all regulators closed at 2000 yesterday. No releases being made

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of7,450 m3/s.

At 6am Wivenhoe Dam was 66.92 m AHD at 1,156,707ML and 99.3%.

The closing sequence had been adjusted late yesterday afternoon to account for issues at Lowood WTP to maintain water levels by holding a release rate to ensure water was available at the temporary Lowood pump station rather than dropping the rate as planned. This extension also meant higher releases for longer so the final level for Wivenhoe will be between 95% and 99% however there will be some increase again due to base flows.

The Lowood temporary pump station was relocated at 2100 last night. This relocation meant they could access water.

Discussions with BCC last night also concluded that tidal variations are primarily back to normal patterns and having a greater impact on the foundation conditions of Coronation Drive than the tapering of releases from the dam.

Hence, the radial gate close down sequence recommenced at 21:45 last night and all gates will be closed this afternoon depending on the final closing sequence as there was no need to extend until Thursday morning.

The dam level when the last gate is closed is expected to be between 66.5m AHD (95.5%) and 66.9m AHD (99.1%) (this is depending on final closure sequence, rate of dam level decrease and not dropping too quickly) and a fish recovery operation will continue through the day during the close down sequence depending on access issues. Releases will continue through the regulator cone valve and possibly the Mini-Hydro (depending on when it can be re-started) to account for ongoing base-flow once all radial gates are closed

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

It should be noted that the Seqwater water level gauge currently being reported on the BoM website is currently slightly under reading by about 50mm.

North Pine

A decision was made at 1900 yesterday to drain the dam down to 39.40m AHD overnight to cater for the inflow resulting from yesterday's storms and ensure that Youngs Crossing remains open during the day today. All gates were closed at 0500 today and a fish recovery operation also commenced at this time. Youngs Crossing will be reopened by the MBRC at around 0700. The dam level will rise slowly during the day and further releases may be required again tonight with more rainfall forecast.

The current lake level is 39.42m AHD at 210,467ML and 98.2%.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels throughout the Brisbane and Pine River catchments and is maintaining close contact with warning agencies and local councils.

Councils have been informed of the current release strategy. The bridges below Wivenhoe Dam will progressively come out of water.

Leslie Harrison Dam:
Gates closed.

Hinze Dam:
Closed.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	19.1.2011	**Time**		**or Event**	Gate closure

From: Dan Spiller [redacted]
Sent: Wednesday, January 19, 2011 7:52 AM
To: 'Bradley John [redacted]
Cc: Barry Dennien [redacted]
Subject: Update on release strategy
Attach: Technical_Situation_Report_W62.docx

All,

Current Technical Situation Report attached for information.

Seqwater has advised that Somerset Dam is at 100% of capacity with no further releases being made.

Wivenhoe Dam is at 99.3%, with all gates to be closed this afternoon. Seqwater advises that the dam level when the last gate is closed is expected to be between 66.5m AHD (95.5%) and 66.9m AHD (99.1%), depending on final closure. Releases will continue through the regulator cone valve and possibly the Mini-Hydro (depending on when it can be re-started) to account for ongoing base-flow once all radial gates are closed

The temporary Lowood pump station was relocated last night, meaning that it is no longer a constraint on the closure sequence.

The strategy was developed in consultation with BCC.

Regards,
Daniel Spiller

TECHNICAL SITUATION REPORT

TSR Number	W62	Date of TSR release	19.1.2011	Time of TSR release	6am

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Close all gates on Wivenhoe Dam by this afternoon.	
Strategy	• Somerset closed down. • Continue closing releases at Wivenhoe.	
Key considerations	Storage levels:	Above FSL
	Inflows:	Total event inflows expected around 2,600,000ML.
	Rainfall:	Some storms overnight
	Lockyer/Bremer:	Monitoring
	Brisbane River:	Impact as below.

Rainfall

Severe thunderstorms passed over the Wivenhoe, Somerset and North Pine dam catchments yesterday afternoon and evening. Falls of 20mm to 30mm where recorded at isolated locations, however not causing any real inflows except at North Pine Dam..

Somerset/Wivenhoe

Somerset Dam peaked at 105.11 mAHD at 06:00 on 12 January 2011.

At 6.30am Somerset was 99.00m and 379,849ML at 100.0% and all regulators closed at 2000 yesterday. No releases being made

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of7,450 m3/s.

At 6am Wivenhoe Dam was 66.92 m AHD at 1,156,707ML and 99.3%.

The closing sequence had been adjusted late yesterday afternoon to account for issues at Lowood WTP to maintain water levels by holding a release rate to ensure water was available at the temporary Lowood pump station rather than dropping the rate as planned. This extension also meant higher releases for longer so the final level for Wivenhoe will be between 95% and 99% however there will be some increase again due to base flows.

The Lowood temporary pump station was relocated at 2100 last night. This relocation meant they could access water.

Discussions with BCC last night also concluded that tidal variations are primarily back to normal patterns and having a greater impact on the foundation conditions of Coronation Drive than the tapering of releases from the dam.

Hence, the radial gate close down sequence recommenced at 21:45 last night and all gates will be closed this afternoon depending on the final closing sequence as there was no need to extend until Thursday morning.

The dam level when the last gate is closed is expected to be between 66.5m AHD (95.5%) and 66.9m AHD (99.1%) (this is depending on final closure sequence, rate of dam level decrease and not dropping too quickly) and a fish recovery operation will continue through the day during the close down sequence depending on access issues. Releases will continue through the regulator cone valve and possibly the Mini-Hydro (depending on when it can be re-started) to account for ongoing base-flow once all radial gates are closed

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

It should be noted that the Seqwater water level gauge currently being reported on the BoM website is currently slightly under reading by about 50mm.

North Pine

A decision was made at 1900 yesterday to drain the dam down to 39.40m AHD overnight to cater for the inflow resulting from yesterday's storms and ensure that Youngs Crossing remains open during the day today. All gates were closed at 0500 today and a fish recovery operation also commenced at this time. Youngs Crossing will be reopened by the MBRC at around 0700. The dam level will rise slowly during the day and further releases may be required again tonight with more rainfall forecast.

The current lake level is 39.42m AHD at 210,467ML and 98.2%.

Strategy

The Flood Operations Centre is continuing to monitor rainfalls and water levels throughout the Brisbane and Pine River catchments and is maintaining close contact with warning agencies and local councils.

Councils have been informed of the current release strategy. The bridges below Wivenhoe Dam will progressively come out of water.

Leslie Harrison Dam:
Gates closed.

Hinze Dam:
Closed.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundatian based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	19.1.2011	**Time**		**or Event**	Gate closure

[redacted]

From: [redacted]
Sent: Wednesday, 19 January 2011 9:11 AM
To: Dan Spiller
Cc: [redacted]; Barry Dennien
Subject: QWC in update loop - URGENT

Categories: T8

Dan
Need to get into the update loop on the changing situation in SEQ especially the stand alone communities. Can we discuss options for myself and Rolf to be included in emails or update sessions?

[redacted]
A/General Manager
Regional Planning and Policy
[redacted]

****
The information in this email together with any attachments is intended only for the person or entity to which it is addressed and may contain confidential and/or privileged material.

Any form of review, disclosure, modification, distribution and/or publication of this email message is prohibited, unless as a necessary part of Departmental business.

If you have received this message in error, you are asked to inform the sender as quickly as possible and delete this message and any copies of this message from your computer and/or your computer system network.
****

[redacted]

From: Dan Spiller
Sent: Wednesday, 19 January 2011 10:06 AM
To: 'WaterGridMedia'
Subject: RE: Dam update for approval

Categories: T8

Approved.

From: WaterGridMedia [redacted]
Sent: Wednesday, January 19, 2011 10:02 AM
To: Dan Spiller
Subject: FW: Dam update for approval
Importance: High

Dan, please see dam update below...let us know if you have any changes, we would like to issue this asap.

Thanks

[redacted]

From: WaterGridMedia
Sent: Wednesday, 19 January 2011 9:20 AM
To: [redacted]
Subject: Dam update for approval
Importance: High

Hi Dan

Please see dam update below for approval at your end.

Regards

[redacted]

WATER GRID MEDIA UPDATE

19 January 2011, 10.00am

GATE CLOSURE COMMENCED AT WIVENHOE DAM

Wivenhoe Dam is at 99.3 per cent with the gate closing sequence expected to be complete by mid-afternoon today.

Inflows and water levels continue to be monitored in the Brisbane and Pine catchments, with more than 20mm of rain received in the Wivenhoe Dam catchment over the last 24 hours.

Small excesses will continue to be released through the cone valve at the base of the Wivenhoe Dam wall once all gates are closed.

Somerset Dam is at 100 per cent capacity with all sluice gates currently closed. Depending on inflows into the catchment, further releases into Wivenhoe Dam may be made over the next 24 hours.

All dam releases are being made in consultation with the Bureau of Meteorology and local councils and every effort is being made to limit downstream impacts where possible.

Residents should contact local councils for detailed information on road crossing closures and other impacts.

Recreation areas around Somerset and Wivenhoe dams remain closed until further notice due to safety.

Further releases from North Pine Dam were made overnight, to cater for the inflows from yesterday's storms. All gates at North Pine Dam were closed at 5.00am this morning.

There have been no further releases from Hinze Dam or Leslie Harrison Dam.

WATER QUALITY

Water across Brisbane and the Sunshine and Gold Coasts remains safe to drink. Water Grid suppliers are continually monitoring water quality across the network and are working closely with Queensland Health.

While Queensland Urban Utilities have a precautionary Boil Water Alert currently in place for Marburg, water in the Ipswich area is also safe to drink.

Boil water alerts are in place for locations in the Lockyer Valley and Somerset council areas and residents and businesses are urged to visit the Queensland Urban Utilities website www.urbanutilities.com.au for more details.

ENDS

Please note a single dam update will now be issued mid-morning each day.

Community Assistance

Please direct the community to contact telephone - 1800 613 122. This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.
Members of the public seeking information on potential impacts in their local areas should direct inquiries to their local councils.

About the SEQ Water Grid

Established in June 2008, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure and is a world class asset in water management in both times of drought and deluge.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Mobile: 0458 249 365
Email: media@seqwgm.com.au

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

[redacted]

From: WaterGridMedia [redacted]
Sent: Wednesday, 19 January 2011 10:13 AM
Subject: WATER GRID MEDIA UPDATE - 19 January 2011

Categories: T8: Media

WATER GRID MEDIA UPDATE

19 January 2011, 10.00am

DAM UPDATE

Wivenhoe Dam is at 99.3 per cent with the gate closing sequence expected to be complete by late afternoon today.

Inflows and water levels continue to be monitored in the Brisbane and Pine catchments, with more than 20mm of rain received in the Wivenhoe Dam catchment over the last 24 hours.

Small excesses will continue to be released through the cone valve at the base of the Wivenhoe Dam wall once all gates are closed.

Somerset Dam is at 100 per cent capacity with all sluice gates currently closed. Depending on inflows into the catchment, further releases into Wivenhoe Dam may be made over the next 24 hours.

All dam releases are being made in consultation with the Bureau of Meteorology and local councils and every effort is being made to limit downstream impacts where possible.

Residents should contact local councils for detailed information on road crossing closures and other impacts.

Recreation areas around Somerset and Wivenhoe dams remain closed until further notice due to safety.

Further releases from North Pine Dam were made overnight, to cater for the inflows from yesterday's storms. All gates at North Pine Dam were closed at 5.00am this morning.

There have been no further releases from Hinze Dam or Leslie Harrison Dam.

WATER QUALITY

Water across Brisbane and the Sunshine and Gold Coasts remains safe to drink. Water Grid suppliers are continually monitoring water quality across the network and are working closely with Queensland Health.

While Queensland Urban Utilities have a precautionary Boil Water Alert currently in place for Marburg, water in the Ipswich area is also safe to drink.

Boil water alerts are in place for locations in the Lockyer Valley and Somerset council areas and residents and businesses are urged to visit the Queensland Urban Utilities website www.urbanutilities.com.au for more details.

ENDS

Please note a single dam update will now be issued mid-morning each day.

Community Assistance

Please direct the community to contact telephone - 1800 613 122. This number has been established for members of the public seeking information on which dams are spilling in South East Queensland.
Members of the public seeking information on potential impacts in their local areas should direct inquiries to their local councils.

About the SEQ Water Grid

Established in June 2008, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure and is a world class asset in water management in both times of drought and deluge.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Mobile: 0458 249 365
Email: media@seqwgm.com.au

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

Dan Spiller

From: Dan Spiller
Sent: Wednesday, 19 January 2011 11:33 AM
To: [redacted]
Subject: Dam levels

Wivenhoe Dam was at 99.3% at 6am this morning. Releases needed to be maintained above 2,000 cumecs until the temporary Lowood pump station was relocated last night. This morning Seqwater advised that, depending upon inflows from rain last night, levels would stabilise at between 96 and 99 % tomorrow morning.

Regards,
Dan

Litsupport Brisbane

From: Rob Drury [redacted]
Sent: Wednesday, 19 January 2011 1:50 PM
To: Rob Drury; Dan Spiller; Peter Borrows; [redacted] Jim Pruss; [redacted]
Cc: [redacted]
Subject: RE: Technical Report W63
Attachments: Technical_Situation_Report_W63.docx

Report W63

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



Swimming in weirs and fast flowing water is FATAL
rethink it.



[redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W63	Date of TSR release	19.1.2011	Time of TSR release	1pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Monitor ongoing rainfall and inflows.	
Strategy	• Somerset closed down. • Wivenhoe closed all gates at 12pm and inspections carried out. A gate opening will then be used for ongoing releases.	
Key considerations	Storage levels:	
	Inflows:	Total event inflows expected around 2,600,000ML.
	Rainfall:	Some storms overnight
	Lockyer/Bremer:	Monitoring
	Brisbane River:	

Somerset/Wivenhoe

Somerset Dam peaked at 105.11 mAHD at 06:00 on 12 January 2011.

At 6.30am Somerset was 99.00m and 379,849ML at 100.0% and all regulators closed at 2000 yesterday. No releases being made

Wivenhoe Dam peaked at 74.97 mAHD at 19:00 on 11 January 2011 with a corresponding discharge of 7,450 m3/s.

At 12pm Wivenhoe Dam was 66.89m AHD at 1,153,508ML and 99.0%.

Gates were closed at 12pm for Inspections and fish recovery. Further releases were then recommenced at 1.30pm for operational reasons, water supply issues downstream and maintenance of flows.

This will be done through minor gate openings.

The combined flood event volume in Somerset and Wivenhoe Dams is estimated to be in excess of 2.6 million megalitres.

It should be noted that the Seqwater water level gauge currently being reported on the BoM website is currently slightly under reading by about 50mm.

North Pine

North Pine will be closely monitored and if any heavy rainfall eventuates, further gate operations may be required.

Strategy

Councils have been informed of the current release strategy. The bridges below Wivenhoe Dam will progressively come out of water.

Leslie Harrison Dam:
Gates closed.

Hinze Dam:
Closed.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the BrisbaneRiver and other relevant Bureau forecasts and warnings (e.g. weather/rain farecasts, Tropical Cyclane Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	flood.qld@bom.gov.au

Brisbane City Council(BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised of the current strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Change in Strategy

[redacted]

From: WaterGridMedia [redacted]
Sent: [redacted] January 2011 3:59 PM
To: [redacted]
Cc: Dan Spiller; WaterGridMedia; SEQWGM Media; [redacted]
Subject: Media Query - The Australian - HIGH PRIORITY for MINISTERS OFFICE

Importance: High

Categories: T8

Hi [redacted]

We have received the enquiry below from the Australian. Dan Spiller is working on a response for all questions from existing information sources however only Seqwater will have details regarding Question 4. Sorry to pile more questions onto you [redacted] but would you please source the information for Question 4 only. Unfortunately the Minister's office wants to get this response out asap.

Many thanks for your help.

Regards
Water Grid Communications Team
[redacted]

In 2007, SEQWater authored a report on "Provision of Contingency Storage in Wivenhoe and Somerset Dams''.
The purpose of the report was to explore options for the provisions of an additional 200 to 600 GL of contingency storage in the Brisbane River catchment
It made a series of recommendations and conclusions, including that "the that the most attractive option for the provision of contingency storage would a 2m raising of Wivenhoe Dam as an operational change eliminating the need for expensive capital works.''
It also stated that neither Wivenhoe nor Somerset currently satisfies the ANCOLD guidelines on Acceptable Flood Capacity.

Questions.

1. What moves have been undertaken to achieve the additional 200GL of storage.
2. Of the seven options, which option was been chosen and has it been completed or progressed? Was cost a consideration in these determinations?
3. Has Wivenhoe and Somerset been brought into line with ANCOLD guidelines and Spillway Adequacy Guidelines
4: The report talks about Somerset Dam and ''cracking in a number of the dam monoliths and other stability concerns'' and the need to address these concerns. Have these concerns been addressed?
5. The report also recommends that a "detailed flood assessment is carried out to develop and assess changes to the flood manual to allow the storage of the additional 2m in Wivenhoe.
6. In today's story, we canvassed the original upgrade options to Wivenhoe and that it was decided to pursue a two-stage upgrade. Could you detail the progress or intent of stage 2.
7. Did Somerset overflow at any stage in the past month.

Water Grid Communications Team

[redacted]

www.watergrid.com.au

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

[redacted]

From: WaterGridMedia [redacted]
Sent: Wednesday, 19 January 2011 4:35 PM
To: [redacted]
Cc: Dan Spiller; WaterGridMedia; SEQWGM Media
Subject: Draft Media Response - The Australian - 19 January 2011
Attachments: Media Response - The Australian_19 January 2011.doc

Importance: High

Categories: T8

Hi [redacted]

Further to our conversation please find attached a draft response to The Australian approved at our end by Dan Spiller. Please note the suggested response for Question 4 which hopefully addresses any legal concerns regarding the Commission of Inquiry.

Answers to all other questions are drawn from previously published information on the public record.

As discussed, there is a strong desire to provide a response to The Australian on these matters.

Water Grid Communications Team

[redacted]

www.watergrid.com.au

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.

SEQ Water Grid

Media Response

TRIM reference:	**Date:** 19 January 2011
Journalist: [redacted]	**Ph:**
Request: Response to questions (below)	
Media Outlet: The Australian	
Email: [redacted]	

"In 2007, SEQWater authored a report on "Provision of Contingency Storage in Wivenhoe and Somerset Dams". The purpose of the report was to explore options for the provisions of an additional 200 to 600 GL of contingency storage in the Brisbane River catchment. It made a series of recommendations and conclusions, including that "the that the most attractive option for the provision of contingency storage would a 2m raising of Wivenhoe Dam as an operational change eliminating the need for expensive capital works." It also stated that neither Wivenhoe nor Somerset currently satisfies the ANCOLD guidelines on Acceptable Flood Capacity."

1. What moves have been undertaken to achieve the additional 200GL of storage.

The options are subject to further investigation. The South East Queensland Water Strategy states that:

> *A detailed investigation will be conducted to determine the maximum level to which the working storage of Wivenhoe Dam could be raised without raising the dam wall. The investigation will be carried out in conjunction with Seqwater and the Brisbane and Ipswich City Councils. It will include detailed consideration of:*
> - *the impact on frequency, severity and duration of flooding both upstream and downstream of the dam*
> - *any effect on the structural integrity of the dam and its components or any required spillway upgrades*
> - *environmental and social impacts, including adverse affects on any roads and crossings caused by flooding.*
>
> *Hydrological investigations will be carried out to determine the increased security of supply or the additional volume of water that could be made avoilable to the SEQ Water Grid while still remaining within the requirements of the water resource plan.*

The Government position on these investigations is clear. At the estimates hearing on 15 July 2010, the Minister for Natural Resources, Mines and Energy and Minister for Trade stated that:

> [redacted]Okay. As much as I would like to pursue the issue, I will move on, given that time is of the essence. Minister, you have tabled a South East Queensland Water Strategy a few moments ago. Section 5.4.2 relates to dams and weirs and explores the issue of either constructing new dams and weirs or augmenting existing dams and weirs. A notable exception from that particular part of the strategy is the augmentation of Wivenhoe Dam—the use of the extra storage that is available in Wivenhoe Dam. Why has the government chosen to ignore the most obvious opportunity to boost the water supply available to South-East Queensland through increasing the water supply storage area within Wivenhoe Dam?

[redacted] The simple reason is that we have not. It may not be in that section, but it is a consideration of the QWC as a project that requires further analysis.

[redacted]o that proposition to adjust the storage level of Wivenhoe Dam is part of the government's water strategy that has been released today? It has been considered for so many years. It seems to be something of a puzzle as to why a decision has not been made about it, given that we face the real opportunity to store extra water there in the near future.

[redacted]: I am advised that the QWC, in conjunction with Seqwater, has already commenced investigations into the extent to which the full supply level of Wivenhoe Dam could be raised, so that kind of work is underway and we await the results of those investigations. I should say it is not government policy, it is work being conducted by QWC. Once that work is completed the government will then determine whether it would be a project that would go forward and when that would occur. I have an open mind. I have no preconceptions about this. I await the result of QWC's work. It is mentioned towards the end of the report in the various actions that will be undertaken by the QWC going forward.

The Opposition position on increasing the operating level of Wivenhoe Dam is also clear.

650 Matters of Public Interest 09 Mar 2010

Wivenhoe Dam

[redacted](Callide—LNP) (12.20 pm): With the recent good rains Wivenhoe Dam is filling rapidly. Today it is approximately 92 per cent full. Wivenhoe Dam was built in the late 1970s. In response to the floods that devastated Brisbane in 1974 it was constructed to have not just a large water supply capacity that has become the basis of our water supply today but also a considerable amount of extra storage volume to act as a flood buffer to help to manage future flooding in Brisbane. As Wivenhoe Dam today approaches full storage level, it is important to note that the full storage level is under half the possible storage level available in the dam. The full storage level is 1.15 million megalitres while the actual total storage available in Wivenhoe Dam is 2.6 million megalitres. In effect there is another Wivenhoe Dam over and above the one that was originally designed for water storage. This 'extra' Wivenhoe Dam was designed and built in the late 1970s as a flood buffer for Brisbane.

I believe that it is time to review the comparative uses of the total storage available in Wivenhoe Dam. I believe that more of the total available storage space should be used for water storage so that there is less chance of a water crisis developing in the future. Obviously the dam needs to continue to be operated to maintain a flood buffer for Brisbane and any decision about storing extra water will have an impact on the effectiveness of that dam's flood buffer role, but this is a question of finding the right balance between the two roles that Wivenhoe Dam performs today. It is a question of reviewing the situation to determine whether the balance between those two roles that was struck in the early 1980s when the dam was completed is appropriate for the situation that exists today.

It is clear that much has changed since 1980. Brisbane and Queensland generally have experienced long periods of low rainfall resulting in a critical water crisis which saw the real possibility of the city running out of water entirely. Since that original decision was made in 1980, technology available to the dam managers has also advanced considerably. We are now able to forecast and predict the occurrence of rainfall events with much more accuracy and much more reliability than was ever thought possible 30 years ago. In addition, the automatic stream flow monitors and computer flow models allow for much better informed decision making in regard to managing any potential flood events. These advances alone make it possible to attain the same level of flood protection for Brisbane while using less of the available storage area in Wivenhoe Dam as a flood buffer. That frees up the additional volume for extra water storage that should be used to complement the available water for South-East Queensland and guard against another water crisis developing in the future.

A discussion paper prepared by Seqwater in 2005 found that an extra seven metres of water could be stored in the dam before there were any concerns about the long-term safety of the dam wall.
A table in that report shows that just an extra two metres of storage in the dam—two metres out of the possible seven—would store an extra 228,000 megalitres of water and provide an extra no-fail yield of

31,000 megalitres per year to the water supply of South-East Queensland. That is roughly equivalent to what could reasonably be expected to be the annual total yield from the Tugun desalination plant. This proposal has the potential to significantly add to water supply reliability in South-East Queensland just by using an extra two metres of the seven metres that is available in Wivenhoe Dam for additional storage.

I believe it would be absurd to release water from Wivenhoe Dam at the current time. It would be absurd to allow any releases until this option is thoroughly investigated. I call on the minister today to ensure that no water is released from Wivenhoe Dam and that serious commitments are made to developing this proposal to increase the storage levels in Wivenhoe Dam. The water that is running into the dam at the moment may well be sorely needed in the future to avert another water crisis.
A quick look at the dam record shows that, under the current rules of operation, an amount of water equal to 30 per cent of the dam's capacity was released in 1999 and then further smaller amounts were released in 2001 and 2002. Even if some of that water had been retained it would have made a huge difference in 2005 and 2006, when the people of Brisbane were facing the worst of the water crisis.

It is time the minister got serious about this issue. The Labor government has seriously mismanaged the water issue for many years. It has brought the city of Brisbane to the brink of running out of water. It then spent billions of dollars in panic on projects that are hideously expensive and grossly inefficient to run. It now thankfully has the opportunity to start to get it right. We need to make the best of our existing infrastructure—infrastructure that was provided by previous conservative governments and that has been poorly managed by the current Labor government.

2. Of the seven options, which option was been chosen and has it been completed or progressed? Was cost a consideration in these determinations?

None of the options have been completed or progressed. As outlined in response to Question 1, these options are subject to further investigation.

3. Has Wivenhoe and Somerset been brought into line with ANCOLD guidelines and Spillway Adequacy Guidelines

The dam spillway was upgraded over 2006 and 2007, increasing its release capacity in extreme floods. This upgrade is designed to ensure the structural integrity of the dam during floods significantly worse than the current event. A further upgrade of the spillway is scheduled to occur by 2035, in order to comply with ANCOLD upgrade. This upgrade is for even more extreme floods. It would have had no impact on the management of the current flood.

4: The report talks about Somerset Dam and "cracking in a number of the dam monoliths and other stability concerns" and the need to address these concerns. Have these concerns been addressed?
This issue will be addressed by the recently announced independent Commission of Inquiry into the south east Queensland flooding.

5. The report also recommends that a "detailed flood assessment is carried out to develop and assess changes to the flood manual to allow the storage of the additional 2m in Wivenhoe.

None of the options have been completed or progressed. As outlined in response to Question 1, these options are subject to further investigation.

6. In today's story, we canvassed the original upgrade options to Wivenhoe and that it was decided to pursue a two-stage upgrade. Could you detail the progress or intent of stage 2.

A further upgrade of the spillway is scheduled to occur by 2035, in order to comply with ANCOLD upgrade. This upgrade is for even more extreme floods. It would have had no impact on the management of the current flood.

7. Did Somerset overflow at any stage in the past month.

Somerset Dam did not overflow at any stage in the past month. Controlled releases were made through gates, at rates specified in daily media updates.

About the SEQ Water Grid: Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information on the Water Grid: www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:

Ph: (07) 3247 3000 | Mobile: 0458 249 347 | Email: media@seqwgm.com.au

[redacted]

From: Dan Spiller
Sent: Wednesday, 19 January 2011 6:43 PM
To: [redacted]
Subject: Re: Floods - Australian wivenhoe response 190111.docx

Categories: T8

[redacted],

As discussed, the line about not reducing the compartment is not accurate.

Also, can you pls advise as soon as a final decision is made on who should issue - I have someone waiting in the office.

Thanks,
Dan

On 19/01/2011, at 6:35 PM, [redacted] wrote:

> <<Floods - Australian wivenhoe response 190111.docx>> FYI
>
> This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
>
> If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and /or publication of this email is also prohibited.
>
> Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.
>
> Please consider the environment before printing this email.
>
> <Floods - Australian wivenhoe response 190111.docx>

[redacted]

From: [redacted]
Sent: Wednesday, 19 January 2011 6:47 PM
To: [redacted] John.Bradley[redacted] Dan Spiller
Cc: Premiers Office - Media Unit; [redacted]
Subject: RE:
Attachments: Floods - Australian wivenhoe response 190111.docx

Categories: T8

Agree with the addition below and have made some amendments to the attached.

<<Floods - Australian wivenhoe response 190111.docx>>

From: [redacted]
Sent: Wednesday, 19 January 2011 6:44 PM
To: [redacted] John.Bradley[redacted] dan.spiller[redacted]
Cc: Premiers Office - Media Unit; [redacted]
Subject:

Following advice from Dan Spiller, could we look at changing the opening paragraph to the following:

This report, "Provision of Contingency Storage in Wivenhoe and Somerset Dams", was written in times of drought with the aim of increasing maximum water supply levels. Options suggested in the report would not have increased the volume of the flood mitigation component of Wivenhoe, but some of the models would have reduced the flood mitigation capacity of Wivenhoe Dam by up to a third.

Also, could this be released from a spokesperson from DERM?

Regards,

[redacted]

Assistant Media Advisor
Office of the Hon. Stephen Robertson MP
Minister for Natural Resources, Mines and Energy and Minister for Trade
Phone: [redacted]
Mobile: [redacted]
e-mail: [redacted]
<mailto[redacted]>

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and /or publication of this email is also prohibited.

Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.

Please consider the environment before printing this email.

In 2007, SEQWater authored a report on "Provision of Contingency Storage in Wivenhoe and Somerset Dams".
The purpose of the report was to explore options for the provisions of an additional 200 to 600 GL of contingency storage in the Brisbane River catchment It made a series of recommendations and conclusions, including that "the that the most attractive option for the provision of contingency storage would a 2m raising of Wivenhoe Dam as an operational change eliminating the need for expensive capital works."
It also stated that neither Wivenhoe nor Somerset currently satisfies the ANCOLD guidelines on Acceptable Flood Capacity.

Questions

1. What moves have been undertaken to achieve the additional 200GL of storage.

2. Of the seven options, which option was been chosen and has it been completed or progressed? Was cost a consideration in these determinations?

3. Has Wivenhoe and Somerset been brought into line with ANCOLD guidelines and Spillway Adequacy Guidelines

4: The report talks about Somerset Dam and "cracking in a number of the dam monoliths and other stability concerns" and the need to address these concerns. Have these concerns been addressed?

5. The report also recommends that a "detailed flood assessment is carried out to develop and assess changes to the flood manual to allow the storage of the additional 2m in Wivenhoe.

6. In today's story, we canvassed the original upgrade options to Wivenhoe and that it was decided to pursue a two-stage upgrade. Could you detail the progress or intent of stage 2.

7. Did Somerset overflow at any stage in the past month.

Response

This report, "Provision of Contingency Storage in Wivenhoe and Somerset Dams", was written in times of drought with the aim of increasing maximum water supply levels. Options suggested in the report would have had little or no effect on the volume of the flood mitigation component of Wivenhoe.

Under the South East Queensland Water Strategy, the options are subject to further investigation. It states: "*A detailed investigation will be conducted to determine the maximum level to which the working storage of Wivenhoe Dam could be raised without raising the dam wall.*"

For further information: http://www.qwc.qld.gov.au/planning/pdf/seqws-full.pdf (section 5.4.2, Moreton Area, p98 as per numbered pages, p106 of document)

At the estimates hearing on 15 July 2010, the Minister for Natural Resources, Stephen Robertson, said: "I am advised that the QWC, in conjunction with SEQwater, has already commenced investigations into the extent to which the full supply level of Wivenhoe Dam could be raised."

For further information: http://parlinfo.parliament.qld.gov.au/isysquery/6d7e3c64-77df-4c73-980a-a5039aeae2d9/3/doc/2010_07_15_EST_C.pdf#xml=http://parlinfo.parliament.qld.gov.au/isysquery/6d7e3c64-77df-4c73-980a-a5039aeae2d9/3/hilite/
(p27)

The dam spillway was upgraded over 2006 and 2007, increasing its release capacity in extreme floods. This upgrade was designed to ensure the structural integrity of the dam during floods significantly worse than the current event.

As explained in the 2007 Provision of Contingency Storage in Wivenhoe and Somerset Dams report, a further upgrade of the spillway is scheduled to occur by 2035.

http://www.qwc.qld.gov.au/planning/pdf/support-docs/provision-of-contingency-storage-in-wivenhoe-and-somerset-da.pdf

Both Wivenhoe and Somerset dams are fully complying with the requirements of DERM's Acceptable Flood Capacity Guidelines and all other Queensland Dam Safety requirements.

Somerset Dam did not overflow at any stage in the past month. Controlled releases were made through gates, at rates specified in daily media updates.

An independent investigation in 2005 by the NSW Department of Commerce found that Somerset Dam, on the basis of the known condition assessment, satisfied the stability criteria for the storage level at EL 109.7m AHD, and can safety handle a 1-in-100,000 year flood event.

Lawyers McCullough Robertson

Documents subject to Cabinet confidentiality

No	Document	Date	Time
1	Email Dan Spiller to [redacted] re Treasurer's request – WCRWS advice	07.10.2010	10.40am
2	Email Dan Spiller to John Bradley re discussion paper on dam full supply level investigations Seqwater gated storages	15.01.2011	8.32am
3	Email John Bradley to Dan Spiller and [redacted] re Urgent – cabinet in confidence	15.01.2011	10.34am
4	Email Dan Spiller to Dan Spiller and others re Should the Wivenhoe have been bigger/ Courier Mail Andrew Bolt Blog	16.01.2011	1.11pm
5	Email Barry Dennien to John Bradley cc Dan Spiller and others re Public inquiry discussion points – brief – cabinet in confidence	25.01.2011	4.32pm

[redacted]

From: Mike Foster [redacted]
Sent: Monday, 11 October 2010 12:24 PM
To: Bradley John
Cc: Dan Spiller; Rob Drury
Subject: Seqwater update as requested

John/Dan

Seqwater operates in accordance with the gazetted flood operations manual

Manual designed to ensure the structural safety of the dam and the mitigate downsteam impacts

The process includes advising councils of any impending impacts on their infrastructure (bridges, roads). Current releases have resulted in the closure of bridges in Ipswich and Somerset Regional Council areas including Town Bridges, Savages Crossing and Colleges Crossing.

Wivenhoe

Currently releasing 23,500 ML/day from Wivenhoe.

Releases have not reached the designated minor flood levels as determined by the BOM and local councils. Current releases are within river banks

At this stage still very much a minor event. Any impact on localised flooding, if at all. would be minor.

If further larger releases are required other bridges may be impacted and these include Burtons Bridge, Kholo Bridge and Mt Crosby Weir and Fernvale Bridge in a planned sequence. At this stage it is very unlikely based on current inflows and projected forecasts that Mt Crosby and Fernvale Bridge will be impacted.

North Pine

Four gates currently operating and releasing approx 52,000Ml/day. In March this year were releasing almost 40,000 ML/day.

Moreton Regional has been advised and has closed Young's Crossing

All impacted Council have been contacted and advised of current releases by Seqwater prior to releases occurring.

Cheers Mike

Mike Foster
Manager Strategic Relations & Communication
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

Ph [redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

From: Mike Foster [redacted]
Sent: Monday, October 11, 2010 12:25 PM
To: Bradley John [redacted]
Cc: Dan Spiller [redacted]
Subject: RE: Flooding

Releases have NOT reached

From: Bradley John [redacted]
Sent: Monday, 11 October 2010 12:14 PM
To: Mike Foster
Cc: Spiller Daniel (SEQWGM)
Subject: Flooding

Mike

In your statement below you have a typo – should it be Releases have NOW or NOT reached the designated.....

> "Releases have no reached the designated minor flood levels as determined by the BOM and local councils."

Dan

Can you pls send me through any stuff you have on this (ie. if preparing a note),

John Bradley
Director-General
Department of Environment and Resource Management
Telephone: [redacted]
Email: [redacted]
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

> **From:** Mike Foster [redacted]
> **Sent:** Monday, 11 October 2010 12:00 PM
> **To:** Bradley John
> **Subject:** FW:
>
> fyi

> **From:** Mike Foster
> **Sent:** Monday, 11 October 2010 11:42 AM
> **To:** Dan Spiller
> **Subject:**
>
> Dan
>
> Releases are currently within river bank

Releases have no reached the designated minor flood levels as determined by the BOM and local councils.

At this stage still very much a minor event. No impact on localised flooding at this stage.

Cheers Mike

Mike Foster
Manager Strategic Relations & Communication
Queensland Bulk Water Supply Authority *trading as* Seqwater



Ph [redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

+--+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+--+

----------Safe Stamp----------
Your Anti-virus Service scanned this email. It is safe from known viruses.
For more information regarding this service, please contact your service provider.
Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

From: Bradley John [redacted]
Sent: Monday, October 11, 2010 12:42 PM
To: Dan Spiller [redacted]; Barry Dennien
Cc: [redacted]
Subject: FW: Seqwater update as requested

FYI

John Bradley
Director-General
Department of Environment and Resource Management
Telephone: [redacted]
Email: [redacted]
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: [redacted] **On Behalf Of** Bradley John
Sent: Monday, 11 October 2010 12:36 PM
To: 'Nicole Scurrah'
Cc: 'ken.smith [redacted] Bradley John
Subject: Seqwater update as requested

Good afternoon all

Please find following Seqwater update as requested.

Thanks
John B

From: Mike Foster [redacted]
Sent: Monday, 11 October 2010 12:24 PM
To: Bradley John
Cc: spiller daniel [redacted] Rob Drury
Subject: Seqwater update as requested

John/Dan

Seqwater operates in accordance with the gazetted flood operations manual

Manual designed to ensure the structural safety of the dam and the mitigate downsteam impacts

The process includes advising councils of any impending impacts on their infrastructure (bridges, roads). Current releases have resulted in the closure of bridges in Ipswich and Somerset Regional Council areas including Town Bridges, Savages Crossing and Colleges Crossing.

Wivenhoe

Currently releasing 23,500 ML/day from Wivenhoe.

Releases have not reached the designated minor flood levels as determined by the BOM and local

councils. Current releases are within river banks

At this stage still very much a minor event. Any impact on localised flooding, if at all. would be minor.

If further larger releases are required other bridges may be impacted and these include Burtons Bridge, Kholo Bridge and Mt Crosby Weir and Fernvale Bridge in a planned sequence. At this stage it is very unlikely based on current inflows and projected forecasts that Mt Crosby and Fernvale Bridge will be impacted.

North Pine

Four gates currently operating and releasing approx 52,000Ml/day. In March this year were releasing almost 40,000 ML/day.

Moreton Regional has been advised and has closed Young's Crossing

All impacted Council have been contacted and advised of current releases by Seqwater prior to releases occurring.

Cheers Mike

Mike Foster
Manager Strategic Relations & Communication
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

PH [redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

[redacted]

From: Bradley John [redacted]
Sent: Monday, October 11, 2010 1:07 PM
To: Mike Foster [redacted]
Cc: Dan Spiller [redacted] Rob Drury [redacted]
Subject: RE: Seqwater update as requested

Rob

Thanks for this - recognising what is happening with localised flooding, can Seqwater please stay in very close contact with local governments, LDMG, EMQ, etc and advise Min office and I of any change in operational practice.

Thanks

John Bradley
Director-General
Department of Environment and Resource Management
Telephone [redacted]
Email [redacted]
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: Mike Foster [redacted]
Sent: Monday, 11 October 2010 12:24 PM
To: Bradley John
Cc: spiller daniel [redacted] Rob Drury
Subject: Seqwater update as requested

John/Dan

Seqwater operates in accordance with the gazetted flood operations manual

Manual designed to ensure the structural safety of the dam and the mitigate downsteam impacts

The process includes advising councils of any impending impacts on their infrastructure (bridges, roads). Current releases have resulted in the closure of bridges in Ipswich and Somerset Regional Council areas including Town Bridges, Savages Crossing and Colleges Crossing.

Wivenhoe

Currently releasing 23,500 ML/day from Wivenhoe.

Releases have not reached the designated minor flood levels as determined by the BOM and local councils. Current releases are within river banks

At this stage still very much a minor event. Any impact on localised flooding, if at all. would be minor.

If further larger releases are required other bridges may be impacted and these include Burtons Bridge, Kholo Bridge and Mt Crosby Weir and Fernvale Bridge in a planned sequence. At this stage it is very unlikely based on current inflows and projected forecasts

that Mt Crosby and Fernvale Bridge will be impacted.

North Pine

Four gates currently operating and releasing approx 52,000Ml/day. In March this year were releasing almost 40,000 ML/day.

Moreton Regional has been advised and has closed Young's Crossing

All impacted Council have been contacted and advised of current releases by Seqwater prior to releases occurring.

Cheers Mike

Mike Foster
Manager Strategic Relations & Communication
Queensland Bulk Water Supply Authority *trading as* Seqwater

seqwater
WATER FOR LIFE

Ph [redacted]
Level 3, 240 Margaret St, Brisbane City QLD 4000
PO Box 16146, City East QLD 4002
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

[redacted]

From: Barry Dennien
Sent: Tuesday, 12 October 2010 8:59 AM
To: Bradley John; [redacted]
Cc: [redacted] Dan Spiller; [redacted]
Subject: Mt Crosby loss of production due to turbid water

John / [redacted]

The Grid emergency team have just met to discuss the Mt Crosby incident.

Status:

Water supply demand supply balance is now stable for central Brisbane zone.

West Bank water treatment plant Mt Crosby is now back online at reduced production at 95 ML/d compared to 250 ML/d typical.
To supply the differential:

- North Pine water treatment plant has been increased by 50 ML/d from 100ML/d
- Southern Regional pipeline transfers from the Gold Coast to Brisbane has been increased to full capacity i.e. from 25ML/d to 90ML/d
- Molendinar Water treatment Plant (Hinze Dam) has been increased to full production from 80 ML/d to 120 ML/d
- East Bank water treatment plant remains off.

Of note the desalination plant at 44ML/d is critical to ensure the Gold Coast region can produce enough water to allow for the export into Brisbane at full capacity.

More fulsome incident report will be coming through shortly.

regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

From: Dan Spiller [redacted]
Sent: Wednesday, October 13, 2010 5:55 PM
To: Bradley John [redacted] Nicole Scurrah [redacted]
Cc: Barry Dennien [redacted]
Subject: Hot issues brief
Attach: HIB_Wivenhoe and flooding.doc

John,

As requested, attached is the Hot Issues Brief provided to the Minister's office.

Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

HOT ISSUE BRIEFING NOTE

HOT ISSUE G.X	**Wivenhoe Dam and regional flooding**
Question	**Is the release from Wivenhoe Dam set to cause regional flooding?**

Issue:

- As reported in the Courier Mail – ***Brisbane suburbs due to flood tomorrow after Wivenhoe Bungle.*** *Parts of Brisbane are set to flood tomorrow regardless of whether it rains or not, because the controlled water released from Wivenhoe Dam will combine with a peak tide."*
- This hot issue brief responds to the question - Is the release of water from Wivenhoe Dam set to cause regional flooding?

Answer:

- Releases from Wivenhoe and Somerset Dam are being made in accordance with the approved flood release manual. This flood management plan is signed off by the Dam Safety Regulator and gazette.

- Wivenhoe and Somerset Dam have provided significant flood mitigation for this event reducing the peak flow in Brisbane by between fifty to sixty percent.

- Current releases from Wivenhoe are approximately one-third of what would naturally come down the river without the dam in place to store flood water.

- As part of managing inflows over the past week Seqwater has held back 500,000-600,000 mega litres (equivalent of a Sydney harbor) which is now being discharged through controlled release.

- The current release was held back until the flood flows from the Bremer and Lockyer had subsided sufficiently.

- The threshold for damaging floods in the Brisbane area is 3500 cubic metres per second and our current releases are well below (1200 cubic metres per second).

- Seqwater does not believe the current releases will have any significant impact in levels in the lower Brisbane River in the coming days.

- In discussions with BOM they agreed the discharges from Wivenhoe will have an insignificant impact on flood levels on lower Brisbane River compared to the high tide impact.

From: Dan Spiller [redacted]
Sent: Wednesday, October 13, 2010 6:19 PM
To: [redacted] Bradley John
Cc: [redacted] Barry Dennien
[redacted]
Subject: RE: urgent Min request

The releases were not a surprise.

The trigger levels and release procedures are the same as they were when SEQ Water was owned by Councils, and similar to those used to manage inflows in 1999.

Seqwater has been in regular contact with Council officers regarding the releases plans, including a teleconference with Brisbane City Council's emergency team on Sunday. No objections were raised.

We are updating the HIB to include these points.

Dan

-----Original Message-----
From: [redacted]
Sent: Wednesday, 13 October 2010 5:55 PM
To: Dan Spiller; Barry Dennien
Subject: urgent Min request

Can you check urgently whether the rules the dam releases are operating under now are the same as those used under SEq water when it was owned by the council. Thanks Geoff

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and /or publication of this email is also prohibited.

Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.

Please consider the environment before printing this email.

[redacted]

From: Barry Dennien
Sent: Wednesday, 13 October 2010 9:55 PM
To: Bradley John; Dan Spiller
Subject: Fwd: Water levels in the Brisbane River at Brisbane City [SEC=UNCLASSIFIED]

John
As discussed the levels are showing a decrease bcc models are predicting an increase

My only assumption is the modellers are using different wivenhoe release volumes or below wivenhoe side stream flow data eg Lockyer ck

We will run to ground first thing

Regards
Barry Dennien

Begin forwarded message:

From: Peter Baddiley <[redacted]
Date: 13 October 2010 9:37:20 PM AEST
To: Barry Dennien [redacted]
Cc: 'Duty Engineer' [redacted] Peter Baddiley [redacted]
Subject: Water levels in the Brisbane River at Brisbane City [SEC=UNCLASSIFIED]

Barry and all

Further to our discussions this evening regarding water levels at Brisbane City, here is a summary of key facts:

1. The highest level reached at the Brisbane City gauge (at bottom end of Edward Street, and near Thornton St ferry on opposite bank of river) this week was about 1.6m AHD just after midday on Monday 11th. This level is just above the Highest Astronomical Tide (HAT or "king tide") of 1.55m AHD at this location.
(The higher than predicted tide will have been caused by a combination of meteorological factors (high onshore winds causing setup, atmospheric pressure etc) and hydrological factors (local inflows, incl creeks & parts of Bremer R flow).

2. Since Monday, the peak water level at the Brisbane City gauge has been getting slightly less each day.

(The reason for this is the decreasing astronomical tide (dropping by about 0.1 metre each day) and the reducing local flood inflows which is outweighing the minimal increase associated with the arriving Wivenhoe Dam discharge.)

3. Today, Wednesday 13 Oct, the peak level had fallen to about 1.3m AHD which occurred at about 2pm. (i.e. about 0.3m less than Monday)

4. For tomorrow Thursday 14, based on flood modelling, the expected highest level is predicted to be quite similar to, and likely slightly less than, today's highest level.

(Current modelling indicates about 1.2m AHD at about 3pm, although this is sensitive to the timing of reductions of local flows compensating slight increases associated with arriving Wivenhoe Dam discharge.)

5. Current modelling indicates that a level of about 1.0 to 1.2 metres AHD will be reached at the Brisbane City gauge with each afternoon/evening high tide for the next few days as releases from Wivenhoe Dam continue.

For future occurrences, it seems that an improved communications strategy is needed to address the issues of misinformation appearing in the media and the associated suggestions of variances between agencies. It may require a daily media release containing some technical information (in appropriate language). The Bureau's flood warning for the Brisbane River is one vehicle for information regarding Brisbane City. For these "non-flood" events, the warning could include a statement (for example) that "flood levels will remain below minor flood level in Brisbane City" or "water levels will remain below normal highest tide levels".

I feel though that an additional statement from an agency associated with the operation of Wivenhoe Dam is needed to ensure a strong, consistent unambiguous message to the media and public.

regards, peter

Peter Baddiley
Regional Hydrology Manager
Climate & Water Division
Bureau of Meteorology
Level 21, 69 Ann Street
GPO Box 413, BRISBANE, QLD, AUSTRALIA, 4001
Phone [redacted]
EMAI[redacted]
WWW : www.bom.gov.au

From: Bradley John [redacted]
Sent: Wednesday, October 13, 2010 10:11 PM
To: Nicole.Scurrah[redacted] ken.smith[redacted] Stephen.Robertson[redacted]
Cc: Barry Dennien[redacted] Dan Spiller[redacted]
Subject: Fw: Fwd: Water levels in the Brisbane River at Brisbane City [SEC=UNCLASSIFIED]

Nicole
Further to previous - BOM is very clear.
John B

----- Original Message -----
From: Barry Dennien[redacted]
To: Bradley John; spiller daniel[redacted]
Sent: Wed Oct 13 21:55:08 2010
Subject: Fwd: Water levels in the Brisbane River at Brisbane City [SEC=UNCLASSIFIED]

John
As discussed the levels are showing a decrease bcc models are predicting an increase

My only assumption is the modellers are using different wivenhoe release volumes or below wivenhoe side stream flow data eg Lockyer ck

We will run to ground first thing

Regards
Barry Dennien

Begin forwarded message:

> From: Peter Baddiley[redacted]
> Date: 13 October 2010 9:37:20 PM AEST
> To: Barry Dennien[redacted]
> Cc: 'Duty Engineer[redacted] Peter Baddiley[redacted]
> Subject: Water levels in the Brisbane River at Brisbane City [SEC=UNCLASSIFIED]
>
> Barry and all
>
> Further to our discussions this evening regarding water levels at Brisbane City, here is a summary of key facts:
>
> 1. The highest level reached at the Brisbane City gauge (at bottom end of Edward Street, and near Thornton St ferry on opposite bank of river) this week was about 1.6m AHD just after midday on Monday 11th. This level is just above the Highest Astronomical Tide (HAT or "king tide") of 1.55m AHD at this location.
>
> (The higher than predicted tide will have been caused by a combination of meteorological factors (high onshore

winds causing setup, atmospheric pressure etc) and hydrological factors (local inflows, incl creeks & parts of Bremer R flow).

2. Since Monday, the peak water level at the Brisbane City gauge has been getting slightly less each day.

(The reason for this is the decreasing astronomical tide (dropping by about 0.1 metre each day) and the reducing local flood inflows which is outweighing the minimal increase associated with the arriving Wivenhoe Dam discharge.)

3. Today, Wednesday 13 Oct, the peak level had fallen to about 1.3m AHD which occurred at about 2pm. (i.e. about 0.3m less than Monday)

4. For tomorrow Thursday 14, based on flood modelling, the expected highest level is predicted to be quite similar to, and likely slightly less than, today's highest level.

(Current modelling indicates about 1.2m AHD at about 3pm, although this is sensitive to the timing of reductions of local flows compensating slight increases associated with arriving Wivenhoe Dam discharge.)

5. Current modelling indicates that a level of about 1.0 to 1.2 metres AHD will be reached at the Brisbane City gauge with each afternoon/evening high tide for the next few days as releases from Wivenhoe Dam continue.

For future occurrences, it seems that an improved communications strategy is needed to address the issues of misinformation appearing in the media and the associated suggestions of variances between agencies. It may require a daily media release containing some technical information (in appropriate language). The Bureau's flood warning for the Brisbane River is one vehicle for information regarding Brisbane City. For these "non-flood" events, the warning could include a statement (for example) that "flood levels will remain below minor flood level in Brisbane City" or "water levels will remain below normal highest tide levels".

I feel though that an additional statement from an agency associated with the operation of Wivenhoe Dam is needed to ensure a strong, consistent unambiguous message to the media and public.

regards, peter

Peter Baddiley
Regional Hydrology Manager
Climate & Water Division
Bureau of Meteorology
Level 21, 69 Ann Street
GPO Box 413, BRISBANE, QLD, AUSTRALIA 4001
Phone: [redacted]
EMAIL [redacted]
WWW : <http://www.bom.gov.au/> www.bom.gov.au

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.

While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

+----------+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+----------+

Litsupport Brisbane

From: Bradley John [redacted]
Sent: Thursday, 14 October 2010 8:40 AM
To: Barry Dennien; Dan Spiller
Subject: Fw: Lines sent to Premier as discussed

----- Original Message -----
From: [redacted]
To: [redacted] Bradley John; [redacted]
Sent: Thu Oct 14 08:17:32 2010
Subject: Lines sent to Premier as discussed

-----Original Message-----
From: [redacted]
Sent: Thursday, 14 October 2010 8:15 AM
To: [redacted] Nicole Scurrah
Subject:

No doubt there has been a massive rain event.

We're taking advice from the experts at SEQ water who tell us that water is being released in a controlled manner within flood prevention guidelines.

Like to assure people that it's because of investment in Wivenhoe that Brisbane is in a much better position than 74.

I'm advised the latest advice from BOM and SEQ water is that:

Since Monday the peak water level has been getting slightly less each day.

In fact, today's peak level is likely to be similar to or slightly less than yesterday's highest level.

-----Original Message-----
From: Bradley John [redacted]
Sent: Thursday, 14 October 2010 7:42 AM
To: [redacted]
Cc: [redacted]
Subject: Fw: Fwd: Water levels in the Brisbane River at Brisbane City [SEC=UNCLASSIFIED]

[redacted]
Assume you saw this advice last night from BOM - logic is quite strong.
JB

----- Original Message -----
From: Bradley John
To: 'Nicole.Scurrah [redacted] <Nicole.Scurra[redacted]
'ken.smith [redacted] <ken.smith[redacted]

'Stephen.Robertso [redacted] <Stephen.Robertso [redacted]
'[redacted]
Cc: 'Barry.Dennien [redacted] <Barry.Dennie [redacted]
'dan.spille[redacted]
Sent: Wed Oct 13 22:11:14 2010
Subject: Fw: Fwd: Water levels in the Brisbane River at Brisbane City [SEC=UNCLASSIFIED]

Nicole
Further to previous - BOM is very clear.
John B

----- Original Message -----
From: Barry Dennien [redacted]
To: Bradley John; spiller daniel [redacted]
Sent: Wed Oct 13 21:55:08 2010
Subject: Fwd: Water levels in the Brisbane River at Brisbane City [SEC=UNCLASSIFIED]

John
As discussed the levels are showing a decrease bcc models are predicting an increase

My only assumption is the modellers are using different wivenhoe release volumes or below wivenhoe side stream flow data eg Lockyer ck

We will run to ground first thing

Regards
Barry Dennien

Begin forwarded message:

From: Peter Baddiley [redacted]
Date: 13 October 2010 9:37:20 PM AEST
To: Barry Dennien [redacted]
Cc: 'Duty Engineer' [redacted] Peter Baddiley [redacted]
Subject: Water levels in the Brisbane River at Brisbane City [SEC=UNCLASSIFIED]

Barry and all

Further to our discussions this evening regarding water levels at Brisbane City, here is a summary of key facts:

1. The highest level reached at the Brisbane City gauge (at bottom end of Edward Street, and near Thornton St ferry on opposite bank of river) this week was about 1.6m AHD just after midday on Monday 11th. This level is just above the Highest Astronomical Tide (HAT or "king tide") of 1.55m AHD at this location.

(The higher than predicted tide will have been caused by a combination of meteorological factors (high onshore winds causing setup, atmospheric pressure etc) and hydrological factors (local inflows, incl creeks & parts of Bremer R flow).

2. Since Monday, the peak water level at the Brisbane City gauge has been getting slightly less each day.

(The reason for this is the decreasing astronomical tide (dropping by about 0.1 metre each day) and the reducing local flood inflows which is outweighing the minimal increase associated with the arriving Wivenhoe Dam discharge.)

3. Today, Wednesday 13 Oct, the peak level had fallen to about 1.3m AHD which occurred at about 2pm. (i.e. about 0.3m less than Monday)

4. For tomorrow Thursday 14, based on flood modelling, the expected highest level is predicted to be quite similar to, and likely slightly less than, today's highest level.

(Current modelling indicates about 1.2m AHD at about 3pm, although this is sensitive to the timing of reductions of local flows compensating slight increases associated with arriving Wivenhoe Dam discharge.)

5. Current modelling indicates that a level of about 1.0 to 1.2 metres AHD will be reached at the Brisbane City gauge with each afternoon/evening high tide for the next few days as releases from Wivenhoe Dam continue.

For future occurrences, it seems that an improved communications strategy is needed to address the issues of misinformation appearing in the media and the associated suggestions of variances between agencies. It may require a daily media release containing some technical information (in appropriate language). The Bureau's flood warning for the Brisbane River is one vehicle for information regarding Brisbane City. For these "non-flood" events, the warning could include a statement (for example) that "flood levels will remain below minor flood level in Brisbane City" or "water levels will remain below normal highest tide levels".

I feel though that an additional statement from an agency associated with the operation of Wivenhoe Dam is needed to ensure a strong, consistent unambiguous message to the media and public.

regards, peter

Peter Baddiley
Regional Hydrology Manager
Climate & Water Division
Bureau of Meteorology
Level 21, 69 Ann Street
GPO Box 413, BRISBANE, QLD, AUSTRALIA 4001
Phone: [redacted]
EMAIL: p.baddiley[redacted]
WWW : <http://www.bom.gov.au/> www.bom.gov.au

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.

While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

+--+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+--+

From: Dan Spiller [redacted]
Sent: Thursday, October 14, 2010 9:23 AM
To: Bradley John [redacted]
Subject: FW: are you able to check this for accuracy?

For info.

-----Original Message-----
From: Dan Spiller
Sent: Thursday, 14 October 2010 9:14 AM
To: [redacted]
Cc: Barry Dennien
Subject: RE: are you able to check this for accuracy?

-----Original Message-----
From: [redacted]
Sent: Thursday, 14 October 2010 9:00 AM
To: Dan Spiller
Cc: Barry Dennien; [redacted]
Subject: are you able to check this for accuracy?

Dan...

The dam safety regulator does not undertake flood modelling - its main role is to assess and manage the risk of catastrophic dam failure. This means ensuring that dams can pass floods without collapsing.

BOM is the point of truth - and public notification - for flood modelling as they have the best information about rainfall and tides. Seqwater provides information on releases to BOM, as one of the inputs to modelling and flood notifications.

BOM modelling predicts that today's high tide (just before 2:30) will be lower than yesterday's high tide. If this prediction is correct, there would not be flooding.

BOM modelling takes into account the impact of releases from Wivenhoe. However, there are many variables which are hard to quantify and might impact on the actually water level at high tide:

- Around half the catchment of the Brisbane R is below Wivenhoe Dam, and it is difficult to precisely predict run-off from this part of the catchment
- The actual height that the tide reaches can vary with onshore wind and other factors
- Wivenhoe is 200km away from the mouth of the river and there are a lot of environmental variables

Council undertakes its own flood modelling. Some differences in the predictions of these kind of models is normal, as there are so many

variables. Issuing flood warnings is a council responsibility and this is why BCC does their own flood modelling.

The Flood Manual that governs the release of water from Wivenhoe was put together in consultation with councils and State agencies.

While the drinking water storage part of Wivenhoe is 100% full, the flood storage part is about one third full. Wivenhoe contains 500 000ML of flood water that must be released - this is more than North Pine, Maroon and Hinze Dam put together. Failure to release flood water from Wivenhoe puts Brisbane at greater risk of significant flooding - particularly with more rain predicted to be on the way. It should not be forgotten that the 1974 floods occurred after two significant rain events close together.

[redacted]
Policy Advisor
Office of the Minister for Natural Resources,
Mines and Energy and Minister for Trade
Phone: [redacted]
Mobile [redacted]
Fax [redacted]

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.

If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.

Unless stated otherwise, this email represents only the views of the sender and not the views of the Queensland Government.

Please consider the environment before printing this email.

From: Dan Spiller [redacted]
Sent: Thursday, October 14, 2010 9:32 AM
To: Bradley John [redacted]
Cc: Barry Dennien [redacted]
Subject: RE: Cd we pls get an EMQ update re potential flood situation?

John,

EMQ is a member of the Brisbane Local Disaster Management Group.

The EMQ representative has advised that the group has not been officially activated, but has been in touch with BCC representatives and are being kept up to date oif the situation.

EMQ will keep us up to date if the situation changes. We will let you know.

Dan

----- Original Message -----
From: [redacted]
To: [redacted]
Cc: Nicole Scurrah [redacted] Premiers Office - Media Unit [redacted] Bradley John

Sent: Thu Oct 14 08:19:07 2010
Subject: RE: Cd we pls get an EMQ update re potential flood situation?

Thanks

From: [redacted]
Sent: Thursday, 14 October 2010 8:13 AM
To: [redacted]
Cc: Nicole Scurrah; Premiers Office - Media Unit
Subject: RE: Cd we pls get an EMQ update re potential flood situation?

Brisbane Local Disaster Management Group is meeting this morning and has undertaken to update EMQ on the situation. As soon as we get that we'll pass it on

BCC has been undertaking hydrology scenario planning overnight and today to try and predict what might happen.

The BOM has not issued any flood warnings for the situation as of yet.

[redacted]
Phone: [redacted]

From [redacted]
Sent: Thursday, 14 October 2010 7:36 AM

To: [redacted]
Cc: Nicole Scurrah; Premiers Office - Media Unit
Subject: Cd we pls get an EMQ update re potential flood situation?

+----------+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+----------+

[redacted]

From: Barry Dennien
Sent: Thursday, 14 October 2010 10:17 AM
To: Bradley John; Dan Spiller; [redacted] Ken Smith
Subject: FW: Tide levels in Brisbane [SEC=UNCLASSIFIED]

Guys

Good news we are on track to meet the forecast lower level in the river today.

Barry

From: [redacted]
Sent: Thursday, 14 October 2010 10:12 AM
To: Barry Dennien
Cc: jtibaldi [redacted] Peter Baddiley
Subject: Tide levels in Brisbane [SEC=UNCLASSIFIED]

Hi Barry,

The URL below will take you to the latest version of the attached image showing the tide level at the Brisbane City gauge. We have provided access to our model results to SEQWATER flood operations centre and I suggest that if you wish to see the results then I would talk with the current duty engineer which I think is John Tibaldi.

From my perspective the measured tides are matching well with the flood model predictions.

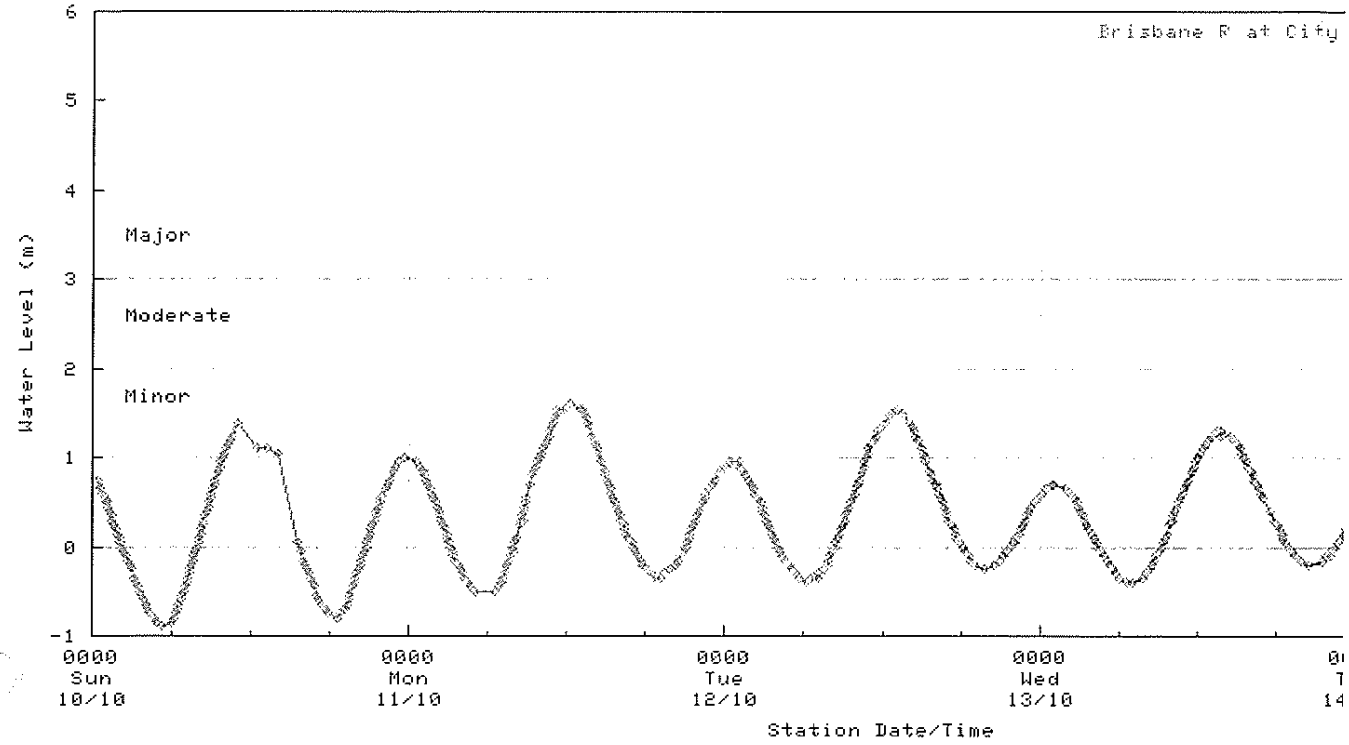
cheers

[redacted]

[redacted]
Supervising Hydrologist
Seasonal Streamflow Forecasting, Extended Hydrological Prediction
Climate and Water Division

Australian Government Bureau of Meteorology
Level 21, 69 Ann Street QLD 4001
Phone: [redacted]

http://www.bom.gov.au/fwo/IDQ65389/IDQ65389.540198.plt.shtml



[redacted]
Supervising Hydrologist
Seasonal Streamflow Forecasting, Extended Hydrological Prediction
Climate and Water Division

Australian Government Bureau of Meteorology
Level 21, 69 Ann Street QLD 4001
Phone: [redacted]

[redacted]

From: Dan Spiller
Sent: Thursday, 14 October 2010 10:20 AM
To: 'Mike Foster'
Subject: FW: Tide levels in Brisbane [SEC=UNCLASSIFIED]

From: Barry Dennien
Sent: Thursday, 14 October 2010 10:17 AM
To: Bradley John; Dan Spiller; [redacted] Ken Smith [redacted]
Subject: FW: Tide levels in Brisbane [SEC=UNCLASSIFIED]

Guys

Good news we are on track to meet the forecast lower level in the river today.

Barry

From: [redacted]
Sent: Thursday, 14 October 2010 10:12 AM
To: Barry Dennien
Cc: jtibald [redacted] Peter Baddiley
Subject: Tide levels in Brisbane [SEC=UNCLASSIFIED]

Hi Barry,

The URL below will take you to the latest version of the attached image showing the tide level at the Brisbane City gauge. We have provided access to our model results to SEQWATER flood operations centre and I suggest that if you wish to see the results then I would talk with the current duty engineer which I think is John Tibaldi.

From my perspective the measured tides are matching well with the flood model predictions.

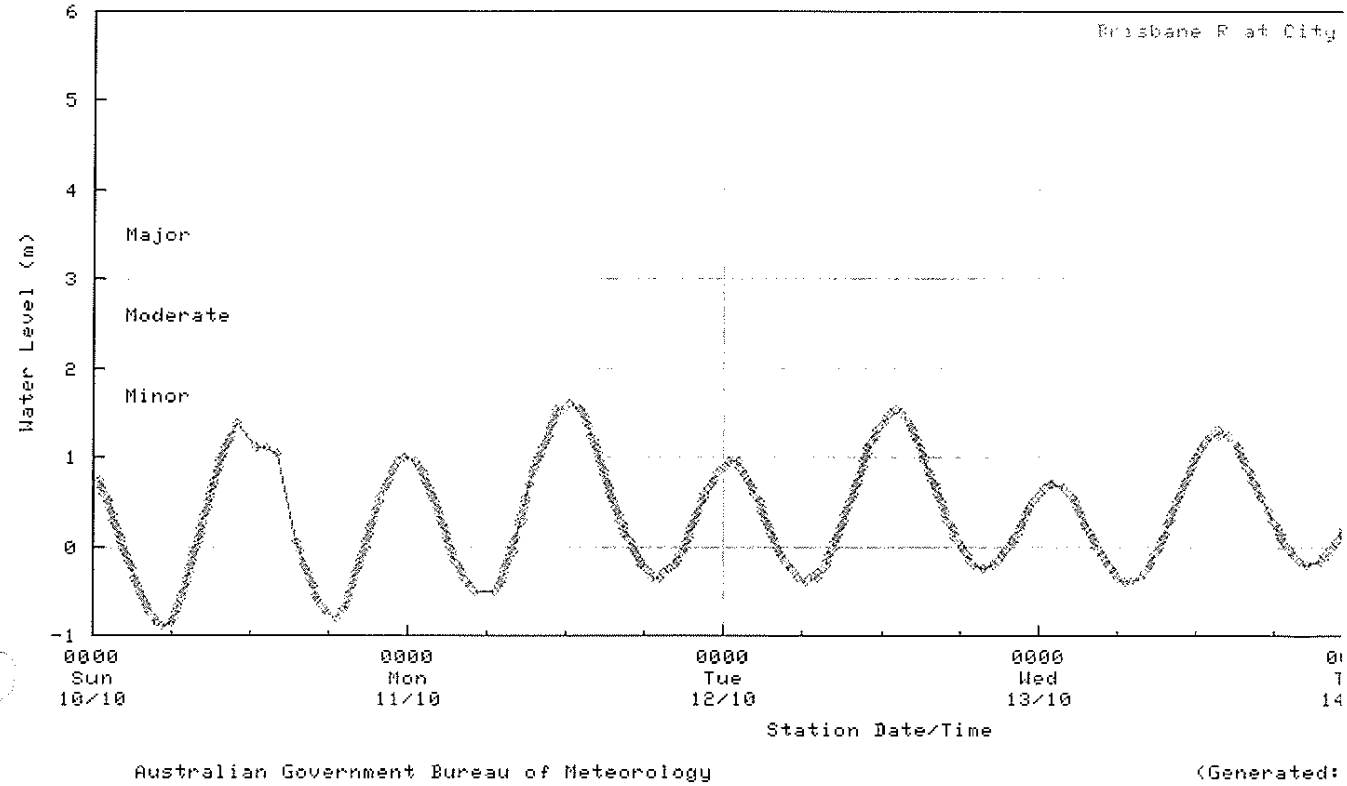
cheers

[redacted]

[redacted]
Supervising Hydrologist
Seasonal Streamflow Forecasting, Extended Hydrological Prediction
Climate and Water Division

Australian Government Bureau of Meteorology
Level 21, 69 Ann Street QLD 4001
Phone [redacted]

http://www.bom.gov.au/fwo/IDQ65389/IDQ65389.540198.plt.shtml



[redacted]
Supervising Hydrologist
Seasonal Streamflow Forecasting, Extended Hydrological Prediction
Climate and Water Division

Australian Government Bureau of Meteorology
Level 21, 69 Ann Street QLD 4001
Phone: [redacted]

[redacted]

From: Barry Dennien
Sent: Monday, 13 December 2010 11:49 AM
To: Bradley John; ken.smith[redacted]
Cc: Dan Spiller; Rob Drury[redacted]
Subject: FW: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM

Ken / John

In accordance with the new flood release protocols I am required to inform you when a release is to be made from Wivenhoe Dam.

All parties to the protocol have been consulted and they raised no concerns with the release strategy.

Note the media release below.

Regards

Barry Dennien

From: SEQWGM Media
Sent: Monday, 13 December 2010 11:20 AM
Subject: Media alert: GATES SET TO OPEN AT WIVENHOE AT 1.00PM

Media alert

Following last night's announcement, one of the five gates at Wivenhoe Dam will be opening today at 1.00pm.

Where: Wivenhoe Dam

When: 1.00pm, Monday 13 December

Photo opportunities: the best photos can be captured from the public viewing platform. This can be accessed by turning left off the Brisbane Valley Highway, near Fernvale.

For further information, please note the media release below.

From: SEQWGM Media
Sent: Sunday, 12 December 2010 5:58 PM
Subject: Media release: HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM

MEDIA RELEASE
12 DECEMBER 2010

HEAVY RAINS PROMPT CONTROLLED RELEASES FROM WIVENHOE DAM

Controlled releases from Wivenhoe Dam are expected to begin tomorrow afternoon, following the weekend's heavy rainfall across South East Queensland.

Water Grid spokesperson Dan Spiller said the dam operators are likely to open one of the five gates, to release a daily average of 30,000 megalitres over a number of days. The releases will restore the dam to just below full supply level.

"The volume of water released will be less than in October, when we had all five gates open and were releasing up to 130,000 megalitres per day," said Mr Spiller.

"Releases are expected to continue until towards the end of the week, depending upon any further rainfall."

Somerset Dam began releasing water into Wivenhoe Dam at midday today, after heavy rainfall on the Sunshine Coast.

All dams throughout South East Queensland have been hovering around 100 per cent capacity since heavy rainfall during early October.

Hinze Dam is continuing to release approximately 5,000 megalitres of water per day through the outlet gates. Several other local dams are continuing to spill.

Mr Spiller said with all the water currently around the area, the community needs to be vigilant about safety around dams, weirs and fast-flowing waters.

"Members of the public need to be aware of the dangers of swimming in weirs and flooded waterways. The facts are that it only takes ankle deep water to knock you off your feet, and only 60 seconds to drown," he said.

"We are discouraging people from visiting Wivenhoe Dam over the next few days to view the gate openings, given how wet the area is and the forecast for further rainfall."

The Water Grid has consulted with Ipswich, Somerset and Brisbane City Councils regarding the decision to release water from Wivenhoe Dam tomorrow.

All release are being managed in accordance with approved flood management plans. Levels in the Lockyer River were taken into account, with the releases from Wivenhoe Dam timed to allow sufficient time for levels downstream to drop.

The release is expected to result in the closure of Twin Bridges, Colleges Crossing and Savages Crossing.

ENDS

Notes to the editor

About the SEQ Water Grid

Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further information visit www.watergrid.com.au

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.



[redacted]

From: Barry Dennien
Sent: Thursday, 14 October 2010 3:57 PM
To: Ken Smith [redacted]; Bradley John [redacted]
Cc: Dan Spiller; [redacted] Peter Borrows
Subject: FW: Brisbane River Water Level Plot
Attachments: Doc1.docx

Ken

Finally confirmation, at 14.29pm we reached 1.2M

Regards

Barry

From: [redacted]
Sent: Thursday, 14 October 2010 3:53 PM
To: Barry Dennien
Subject: Brisbane River Water Level Plot

Latest River Heights for Brisbane R at City Gauge

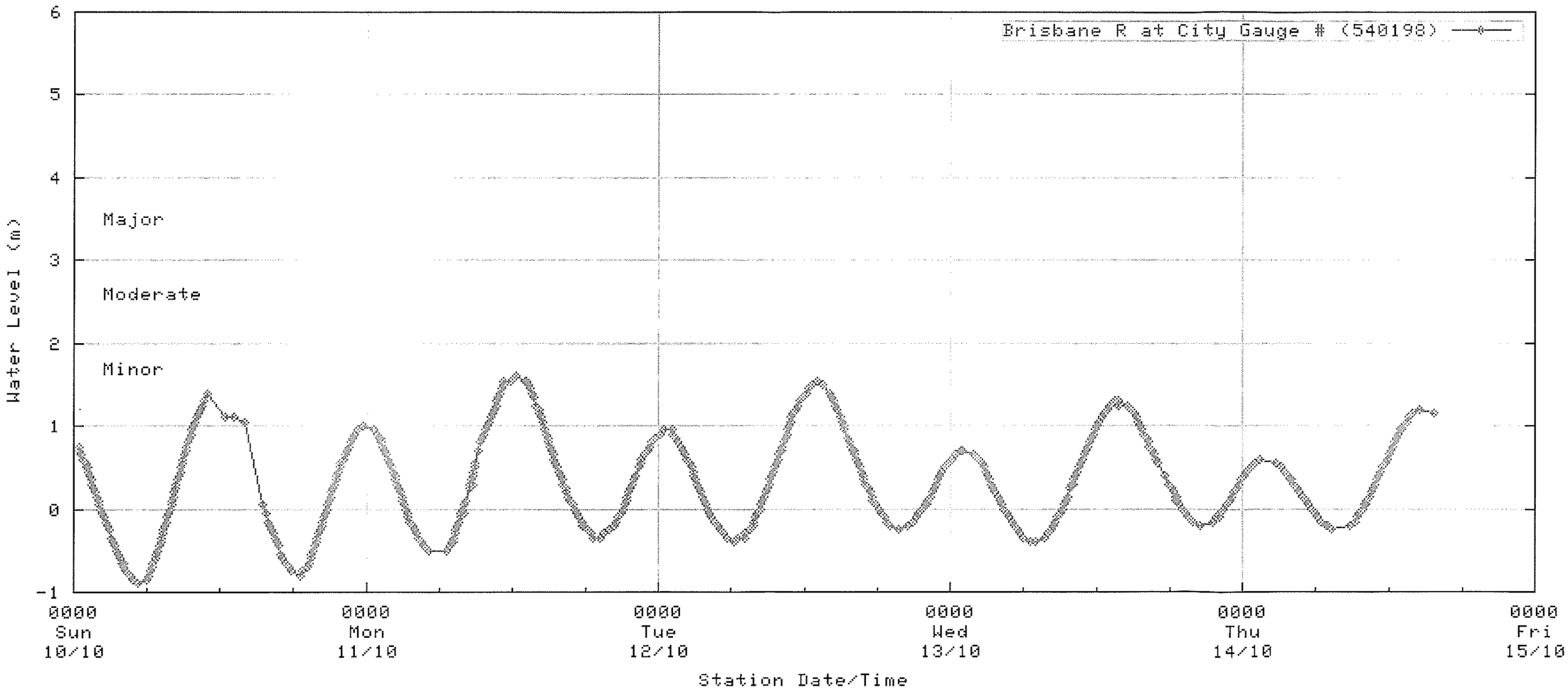
Issued at 3:43 pm EST Thursday 14 October 2010

About river heights plots | About this Plot

Station details: Station Number: 540198 **Name:** Brisbane R at City Gauge # **Owner:** SEQWCO:143838
Flood levels: Minor: 1.70 **Moderate:** 2.60 **Major:** 3.50

Data from the previous 4 days.

Last 3 water levels plotted: 13:53 – 1.15, 14:29 – 1.20, 15:38 – 1.15



Australian Government Bureau of Meteorology (Generated: 14/10/2010 15:43:36)

[redacted]

From: Barry Dennien
Sent: Friday, 17 December 2010 1:37 PM
To: Dan Spiller [redacted] John Bradley [redacted]
Subject: FW: Technical Report W5
Attachments: Technical Stuation Report W5.docx

Follow Up Flag: Follow up
Flag Status: Flagged

John

Latest technical report supporting the planned flood release tonight. We are continuing to discuss with Seqwater if this release can be extended in either time or volume to reduce the flood storage level below full supply level and possibly mitigate the on and off again releases during this wet period. Keep you updated.

Barry

From: Rob Drury [redacted]
Sent: Friday, 17 December 2010 1:28 PM
To: Dan Spiller
Cc: Barry Dennien; Peter Borrows; Jim Pruss; Mike Foster; [redacted]
Subject: Technical Report W5

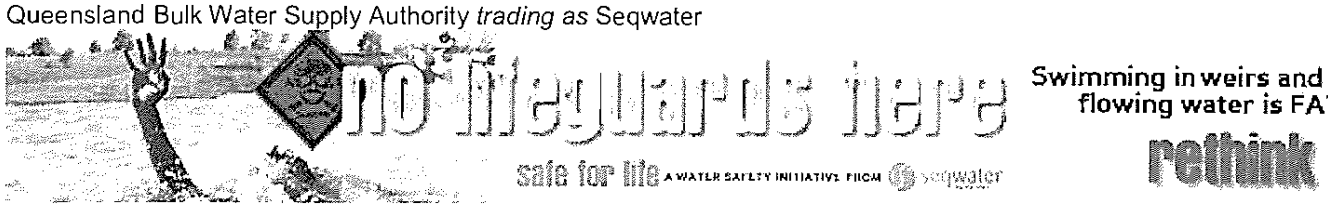
Attached is the Technical Report W5.

Barry,
It should cover off on your questions in your email before as well.

Hadn't sent this through earlier as for such minor releases, I send the Technical Report through when we have contacted Councils and have a fairly clear understanding of where we are heading so the technical info has been shared and there is communication with Councils and then rely on the Communications process to give the early update to WGM and others as was done this morning.

Rob

Robert Drury
Dam Operations Manager
Water Delivery
Queensland Bulk Water Supply Authority *trading as* Seqwater



seqwater
WATER FOR LIFE

Ph [redacted]
Wivenhoe Dam, Brisbane Valley Highway, via Fernvale Q4306 Australia
PO Box 37, Fernvale QLD 4306
Website | www.seqwater.com.au

Important information: This email and any attached information is intended only for the addressee and may contain confidential and/or privileged information. If you are not the addressee, you are notified that any transmission, distribution, or other use of this information is strictly prohibited. The confidentiality attached to this email is not waived, lost or destroyed by reasons of mistaken delivery to you. If you have received this email in error please contact the sender immediately and delete the material from your email system. QLD Bulk Water Supply Authority ABN75450239876 (Trading as Seqwater).

TECHNICAL SITUATION REPORT

TSR Number	W5	Date of TSR release	17.12.2010	Time of TSR release	12pm

Seqwater status of inflows and dam operations

Somerset/Wivenhoe Dams

The previous release plan was to get Wivenhoe dam as close to FSL as possible without inundating Burtons bridge and balance this off against opening Colleges Crossing as soon as possible. The BOM forecasts on Wednesday when the decision was made to proceed with closure on Thursday morning indicated a low chance of significant rainfall until Sunday and unfortunately these forecasts did not prove correct and were revised upwards on Thursday.

A decision to commence a release tonight was made this morning by Duty Flood Engineers to provide as much notice to impacted Councils as possible. Due to the large storms experienced yesterday afternoon and night, the current rain on the ground will result in over 60,000ML needing to be released from Wivenhoe and Somerset Dams to achieve FSL. Additionally BOM are forecasting an additional 20 to 50 millimetres of rain tonight, with further rain forecast through the weekend. If this rain eventuates, substantial flood releases will occur impacting a number of bridges along the river.

The extent of the release commencing tonight will depend on the rain that falls in the catchment over the next 72 hours. This could vary between 10 and 100+ millimetres and the release strategy will be developed in accordance with the Manual of Flood Mitigation as the situation develops. The objectives of the release will be to protect the safety of the dam while minimising flooding impacts on the crossings downstream of the dam in the Brisbane River.

Councils were contacted this morning to advise of the strategy and they had no concerns with the strategy and agreed with the strategy.

Twin Bridges, Savages Crossing and Colleges Crossing may be impacted by releases but it depends to some extent on the rainfall tonight and weekend. Significant rainfall could result in other bridges being impacted by releases.

A follow up email will be sent in case Councils want to provide an assessment.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised of the strategy.

Action taken was to mobilise the flood centre.

BoM Technical Officer name	
BoM Technical Officer position title	
BoM Technical Officer contact details	[redacted]

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council was advised of the strategy.

Action taken was to mobilise the flood centre.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council was advised of the strategy.

Action taken was to mobilise the flood centre.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council was advised of the strategy.

Action taken was to mobilise the flood centre.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator

SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	Date	17.12.2010	Time		or Event	Gate opening

[redacted]

From: Barry Dennien
Sent: Monday, 20 December 2010 9:17 AM
To: John Bradley; Ken Smith
Cc: Dan Spiller
Subject: Wivenhoe increased releases
Attachments: Technical Stuation Report W12.docx

Gentlemen

Releases from Wivenhoe will increase tonight from approximately 8000 – 30,000 Ml/day to 104,000 – 130,000 Ml/day (1200 - 1500 cubic meters per second)

This will mean Burtons and Kholo bridges will also be closed in addition to Twin bridges, Savages and Colleges crossings currently closed.

The strategy is to allow people to get home tonight before increasing releases.

This will lower the flood storage in readiness for forecasted rain on Wednesday.

All Councils are consulted and in agreement (protocols working).

Regards

Barry Dennien
Chief Executive Officer
SEQ Water Grid Manager
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street, Brisbane
Post: PO Box 16205, City East Qld 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

TECHNICAL SITUATION REPORT

TSR Number	W12	Date of TSR release	20.12.2010	Time of TSR release	9am

Seqwater status of inflows and dam operations

Somerset/Wivenhoe Dams

Somerset Dam has risen steadily overnight to currently be at around 100.2m AHD. A sluice gate will be opened at 0700 this morning, with a further sluice gate opened later today. Sluice gate releases are projected to continue until around Wednesday morning, when the dam level will approach FSL. Dam inflow should peak today at around 700 cumecs.

Wivenhoe Dam has risen steadily overnight, with the level projected to reach 68.0m AHD by this afternoon. The proposed strategy is to ramp up releases to have the dam drained to FSL by Saturday. This will require both Burtons and Kholo bridges to be inundated, with dam discharges in excess of 1200 cumecs. This strategy has been discussed with the impacted Councils this morning. Dam inflow excluding Somerset Dam outflows should peak tomorrow at around 1800 cumecs.

Currently Somerset and Wivenhoe are storing around 140,000ML above FSL with further inflows occurring.

Releases from Wivenhoe are being reduced slightly this morning to prevent Burtons Bridge being affected by flows down Lockyer Creek. Releases are then expected to increase from Wivenhoe Dam late this afternoon once Somerset Regional Council have had time to advise residents affected by Burtons Bridge being inundated.

Releases will then be increased overnight to around 1200m3/sec or higher (possibly 1500m3/s) depending on ongoing inflows to the dams and flows downstream of the dam.

A heads up was provided to Somerset Regional Council on Sunday and they were advised again at 8am of the strategy. They did not have a concern as long as there was a lead time and releases were not ramped up until Monday afternoon and media releases were made.

Ipswich City Council and Brisbane City Council wee both advised at 8am today and had no concerns with the strategy.

Emails have been sent to all Councils requesting an assessment if they want to forward one in.

The BoM has been advised.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
0410378740	[redacted]

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) ond other updates/comments if needed)

The Flood Centre has spoken to the Duty Flood Engineer (Jimmy Stewart) at the BoM FWC at 8.15am today and discussed the proposed release strategy for Wivenhoe Dam. They will incorporate the new advice into their warning system. Proposed releases will be provided to BoM and Councils when model scenarios are complete.

BoM Technical Officer name	Jimmy Stewart
BoM Technical Officer position title	Duty Flood Engineer
BoM Technical Officer contact details	[redacted]

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

BCC has been contacted to advise and discuss.
Email sent to request any assessment.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

ICC has been contacted to advise and discuss.
Email sent to request any assessment.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

SRC has been contacted to advise and discuss.
Email sent to request any assessment.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**	20.12.2010	**Time**	Late afternoon	**or Event**	

From: Bradley John [redacted]
Sent: Wednesday, December 22, 2010 1:35 PM
To: [redacted]
Cc: Dan Spiller [redacted] Brown Damien [redacted] Wall Terry [redacted] Barry Dennien [redacted] Best Debbie [redacted]
Subject: RE: Brisbane residents sandbagging against localised floods

[redacted]

Can you pls pull together for 4.00 or 5.00pm tomorrow a DERM portfolio SITREP discussion in advance of SDMG on Friday to run through latest on key issues.

We will need attendees at least as above....

My starting point for agenda is below but happy for others to add to it.

- Mines Preparation (Terry/Damien)
  - CQ Mines - TEP approvals etc
  - NW Mines - Current Status / Imminent Risks (Gulf System, etc)
- SEQ Flood Risk Management (Barry/Dan)
  - (Dam releases etc)
- Other regional Dam release issues (if any worth discussing, if not remove) - Terry / OWSR
- QPWS preparation (Andrea)

Intent would be to get a one pager or key SITREPs on each topic. Key focus should be on

- Current Status/Risk
- Incident management readiness
- Resource Availability and On Call arrangements if needed – eg. processing permits/approvals.

thanks alot

John Bradley
Director-General
Department of Environment and Resource Management
Telephone: [redacted]
Email: [redacted]
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: Barry Dennien [redacted]
Sent: Wednesday, 22 December 2010 1:13 PM
To: Ken Smith; Bradley John
Cc: spiller danie [redacted]
Subject: RE: Brisbane residents sandbagging against localised floods

Ken

Current release rate is 110,000 megalitres per day (1300 cubic meters per second) October releases were at a maximum of 1500 cubic meters per second. These are expected to continue until tomorrow and then cut back over the xmas break. However the variable in all of this is the rain forecast. Wivenhoe is at 106% and we are targeting 100% by tomorrow allowing for inflows still coming .

The forecast could change in the coming days with the low forming off the Mid East Coast of Queensland, getting the dam back to 100% is critical in case the rain event escalates.

The tide peaked today at 1.85m and tomorrow and Friday will peek slightly higher than at 1.95m this is higher than October 1.66m peak. Then the tides will start to decrease.

We remain in close communication with the BOM and BCC. The protocol is being followed.

Regards

Barry

From: Ken Smith [redacted]
Sent: Wednesday, 22 December 2010 12:53 PM
To: John Bradley [redacted]; Barry Dennien
Subject: FW: Brisbane residents sandbagging against localised floods

John and Barry

Some very localised flooding. What are the current release levels from Wivenhoe?

Regards

Ken Smith
Director-General
Department of the Premier and Cabinet
Phone: [redacted]
Mobile: [redacted]
Email: [redacted]

Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au
Please consider the environment before printing this email (3 sheets of paper = 1 litre of water)

From: [redacted]
Sent: Wednesday, 22 December 2010 12:41 PM
To: Anna Bligh; Premiers Office - Media Unit; [redacted]
Cc: Ken Smith
Subject: Brisbane residents sandbagging against localised floods

Brisbane residents sandbagging against localised floods

By Stephanie Smail ABC News

Posted 11 minutes ago

- Map: Brisbane 4000

Tidal flooding has inundated some suburbs along the Brisbane River this morning.

Days of heavy rain, storm run-off and releases from the Wivenhoe Dam, north of Ipswich, have raised river levels.

There is minor flooding in suburbs including Windsor, Albion and Newstead.

The Brisbane City Council says some sandbagging is underway but the water levels are already dropping.

[redacted]
Director, Government Media Unit
Office of the Premier of Queensland
P [redacted]
M
E

This email is intended only for the addressee. Its use is limited to that intended by the author at the time and it is not to be distributed without the author's consent.

Unless otherwise stated, the State of Queensland accepts no liability for the contents of this email except where subsequently confirmed in writing. The opinions expressed in this email are those of the author and do not necessarily represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.

This email, together with any attachments, is intended for the named recipient(s) only, and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it, any form of disclosure, modification, dissemination and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

+--+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+--+

Subject: DERM Portfolio SITREP: flooding issues
Location: DG's Boardroom

Start: 23/12/2010 4:00 PM
End: 23/12/2010 5:00 PM
Show Time As: Busy

Recurrence: (none)

Meeting Status: Not yet responded

Required Attendees: [redacted] Wall Terry; Best Debbie; Dan Spiller; Brown Damien; [redacted] Barry Dennien [redacted]

Resources: DG's Boardroom

When: Thursday, 23 December 2010 4:00 PM-5:00 PM (GMT+10:00) Brisbane.
Where: DG's Boardroom

Note: The GMT offset above does not reflect daylight saving time adjustments.

~~*~*~*~*~*~*~*~*

<<RE: Brisbane residents sandbagging against localised floods>>
As per DG's email.

Thanks
[redacted]

+--+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+--+

From: Bradley John [redacted]
Sent: Wednesday, December 22, 2010 1:35 PM
To: [redacted]
Cc: Dan Spille[redacted]; Brown Damien[redacted]; Wall Terr[redacted] Barry Dennien[redacted] Best Debbie [redacted]
Subject: RE: Brisbane residents sandbagging against localised floods

[redacted]

Can you pls pull together for 4.00 or 5.00pm tomorrow a DERM portfolio SITREP discussion in advence of SDMG on Friday to run through latest on key issues.

We will need attendees at least as above....

My starting point for agenda is below but happy for others to add to it.

- Mines Preparation (Terry/Damien)
  - CQ Mines - TEP approvals etc
  - NW Mines - Current Status / Imminent Risks (Gulf System, etc)
- SEQ Flood Risk Management (Barry/Dan)
  - (Dam releases etc)
- Other regional Dam release issues (if any worth discussing, if not remove) - Terry / OWSR
- QPWS preparation (Andrea)

Intent would be to get a one pager or key SITREPs on each topic. Key focus should be on

- Current Status/Risk
- Incident management readiness
- Resource Availability and On Call arrangements if needed – eg. processing permits/approvals.

thanks alot

John Bradley
Director-General
Department of Environment and Resource Management
Telephone[redacted]
Email:[redacted]
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: Barry Dennien[redacted]
Sent: Wednesday, 22 December 2010 1:13 PM
To: Ken Smith; Bradley John[redacted]
Cc: spiller daniel[redacted]
Subject: RE: Brisbane residents sandbagging against localised floods

Ken

Current release rate is 110,000 megalitres per day (1300 cubic meters per second) October releases were at a maximum of 1500 cubic meters per second. These are expected to continue until tomorrow and then cut back over the xmas break. However the variable in all of this is the rain forecast. Wivenhoe is at 106% and we are targeting 100% by tomorrow allowing for inflows still coming .

The forecast could change in the coming days with the low forming off the Mid East Coast of Queensland, getting the dam back to 100% is critical in case the rain event escalates.

The tide peaked today at 1.85m and tomorrow and Friday will peak slightly higher than at 1.95m this is higher than October 1.66m peak. Then the tides will start to decrease.

We remain in close communication with the BOM and BCC. The protocol is being followed.

Regards

Barry

From: Ken Smith[redacted]
Sent: Wednesday, 22 December 2010 12:57 PM
To: John Bradley[redacted]; Barry Dennien
Subject: FW: Brisbane residents sandbagging against localised floods

John and Barry

Some very localised flooding. What are the current release levels from Wivenhne?

Regards

Ken Smith
Director-General
Department of the Premier and Cabinet
Phone[redacted]
Mobile[redacted]
Email[redacted]

Tomorrow's Queensland: strong, green, smart, healthy and fair - www.towardQ2.qld.gov.au
Please consider the environment before printing this email (3 sheets of paper = 1 litre of water)

From: [redacted]
Sent: Wednesday, 22 December 2010 12:41 PM
To: Anna Bligh; Premiers Office - Media Unit [redacted]
Cc: Ken Smith
Subject: Brisbane residents sandbagging against localised floods

Brisbane residents sandbagging against localised floods

By Stephanie Smail ABC News

Posted 11 minutes ago

- Map: Brisbane 4000

Tidal flooding has inundated some suburbs along the Brisbane River this morning.

Days of heavy rain, storm run-off and releases from the Wivenhoe Dam, north of Ipswich, have raised river levels.

There is minor flooding in suburbs including Windsor, Albion and Newstead.

The Brisbane City Council says some sandbagging is underway but the water levels are already dropping.

[redacted]
Director, Government Media Unit
Office of the Premier of Queensland
P [redacted]
M
E

This email is intended only for the addressee. Its use is limited to that intended by the author at the time and it is not to be distributed without the author's consent.

Unless otherwise stated, the State of Queensland accepts no liability for the contents of this email except where subsequently confirmed in writing. The opinions expressed in this email are those of the author and do not necessarily represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.

This email, together with any attachments, is intended for the named recipient(s) only, and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it, any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager or the Queensland Government.

[redacted]

From: Dan Spiller
Sent: Wednesday, 22 December 2010 2:13 PM
To: John Bradley [redacted] Ken Smith
Cc: [redacted] Barry Dennien
Subject: RE: Media update - Dam releases

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: T9: Emergency

Ken and John,

Advertisements below, as per Barry's email.

In addition to dam releases, we are worried about people going to the dams to camp just as they are closed – or that we may need to close the facilities during the week (we were expected 150,000 people to use the dam recreation facilities this Christmas holiday).

We are also anxious to highlight that closures of Council-owned roads is a matter for those Councils – and may occur for reasons other than dam releases, including local flooding and maintenance.

Newspaper and radio scripts below. Scripts have been approved by Council officers.

Cost of newspaper advertising is about $25k, funded by WGM. Radio will be focussed on Thursday and Friday, with press advertising next week (no press spots available this week).

John: Advertising approved in principle by MO. Geoff is reviewing text now.

Dan

Approved text for print ads:

WATER GRID COMMUNITY SERVICE ANNOUNCEMENT

Wet weather means that water releases from dams across the region are likely to continue this holiday season.

For daily information on dam releases in South East Queensland, contact 1800 613 122.

While every effort will be made to keep recreational sites open, public safety is paramount and it is possible that some sites may be closed at short notice due to heavy weather.

The Water Grid is urging campers at South East Queensland dams to consider a plan B this holiday season.

For more information on the status of dam levels and Water Grid recreation sites visit www.watergrid.com.au

For information on local flooding, including road closures, contact the local council or visit their website.

The council areas that are affected by Wivenhoe Dam releases are:

- Somerset Regional Council; 5424 4000; www.somerset.qld.gov.au
- Ipswich City Council; 3810 6666; www.ipswich.qld.gov.au
- Brisbane City Council; 3403 8888; www.brisbane.qld.gov.au

Approved radio script:

Wet weather means that water releases from dams across South East Queensland are likely to continue this holiday season.

To find out the latest information on dam releases call 1800 613 122.

The Water Grid is making every effort to keep recreational sites open, but public safety is paramount. Some sites may need to be closed at short notice. Visit www.watergrid.com.au for the latest information.

For information on local flooding, including road closures, contact the local council or visit their website.

From: Barry Dennien
Sent: Wednesday, 22 December 2010 2:03 PM
To: John Bradley [redacted]; Ken Smith
Cc: [redacted] Dan Spiller
Subject: FW: Media update - Dam releases

Ken John

We will keep you updated on our press releases from now on.

Also see attached this morning's "Technical Situation Report"

This report is a key step in the Premier's flood release protocol.

Dan Spiller will shortly send through some advertising we are planning over the coming days with regards flood releases and Dam recreation.

I will send through a fact sheet on Wivenhoe Flood Management in the next few hours after it comes back from the editor.

Regards

Barry

From: SEQWGM Media
Sent: Wednesday, 22 December 2010 10:47 AM
Subject: Media update - Dam releases

22 December 2010 - Morning

Media update: Dam releases

Releases from Wivenhoe Dam continued overnight with all five spillway gates at Wivenhoe Dam opened.

The current release volume of 110,000 megalitres will be maintained until Thursday 23 December 2010, when releases are expected to reduce as the flood storage compartment empties.

Continued gate operations are being assessed depending on whether the forecasted level of rainfall and inflows is received over the Christmas period.

The Water Grid continues to work closely with local councils regarding the likely impacts of these releases on surrounding areas which include the closure of Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Crossing and Kholo Crossing.

Releases equivalent to about 35,000 megalitres per day are continuing from Somerset Dam into Wivenhoe Dam, and are expected to continue depending on forecast rainfall.

The gates at Leslie Harrison Dam closed at 4.00pm yesterday, after a minor release was made.

Members of the public seeking information on potential impacts in their local areas should direct inquiries to their local councils.

For recorded information on current dam releases in South East Queensland, members of the public are encouraged to call **1800 613 122**.

Recreation update

While every effort will be made to keep recreational sites open, public safety is paramount and it is possible that some sites may be closed at short notice due to heavy weather.

Therefore, members of the public who are considering recreational activities including camping at South East Queensland dams over the Christmas/New Year period are urged to explore other options – have a plan B.

Currently, Somerset Dam has been re-opened for all water-based recreational activities, however this may change.

Likewise, Wivenhoe Dam has also been re-opened for all water-based recreational activities, however the following recreation sites at Wivenhoe remain closed:

- Hamon Cove
- Captain Logan Camp
- Billies Bay

Atkinson's Crossing at Wivenhoe Dam is currently open however river access is closed.

Lake Maroon is currently closed to swimming and skiing due to recent heavy rainfall however boating and fishing are still currently allowed.

For further information on the Water Grid: www.watergrid.com.au

ENDS

Notes to the editor

About the SEQ Water Grid

Established in June 2008 in response to the crippling Millennium Drought, the SEQ Water Grid represents one of Australia's largest investments in water infrastructure.

Through a network of climate resilient water sources, treatment facilities, new two-way pipes and existing pipelines, the SEQ Water Grid gives the South East Queensland region the ability to support water demands, water quality, economic prosperity and lifestyle - regardless of climate change and population growth.

For further details contact the SEQ Water Grid Communications Unit on:
Ph: (07) 3247 3000 | Email: media@seqwgm.com.au

[redacted]
Senior Correspondence Officer
SEQ Water Grid Communications Unit
SEQ Water Grid Manager
Phone [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002

From: Bradley John [redacted]
Sent: Wednesday, December 22, 2010 5:56 PM
To: Ken Smith [redacted]
Cc: Dan Spiller [redacted] Barry Dennien [redacted]
Subject: FW: Wivenhoe Dam talking points
Attach: speaking points - premiers - wivenhoe dam flood capacity.doc

---

Ken

Barry and Dan have prepared the attached which look good to me.

If you are OK with them, they can be used to enrich the earlier draft of the fact sheet which Barry sent you earlier today.

For consideration,

John Bradley
Director-General
Department of Environment and Resource Management
Telephone: [redacted]
Email: [redacted]
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: Dan Spiller [redacted]
Sent: Wednesday, 22 December 2010 5:23 PM
To: Bradley John [redacted]
Cc: Dennien Barry [redacted]
Subject: Wivenhoe Dam talking points

John,

As requested.

Regards,
Dan

Daniel Spiller
Director, Operations
SEQ Water Grid Manager
Phone: [redacted]
Email: [redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

Please consider the environment before printing this email. It takes 10 litres of water to make one sheet of A4 paper.

Disclaimer
This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because

you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited. While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

SEQ Water Grid

Speaking Points

TRIM reference: D/10/8065	Enquiry received: 22 December 2010
Purpose: speaking points on Wivenhoe Dam flood preparation	

SEQ Water Grid flood preparation

- We will not take risks with the safety of South East Queensland during flood events.
- 1974 taught us was that flood storage capacity is necessary to ensure the safety of people and property in the Brisbane region. The past two months have only highlighted this.
- Wivenhoe Dam was designed with 1.45 million megalitres of flood storage – equivalent to two and a half times Sydney Harbour.
- It is this flood storage capacity that provides protection for South East Queensland during flood – it is the only lever we have to control flooding in Ipswich and Brisbane.
- The flood storage compartment means that we can hold back flood water, and make controlled releases when downstream flows subside. For example, we recently held back water in Wivenhoe Dam until after flows from the Lockyer Valley had passed.

- This is a large storage, but can potentially fill within less than three days in heavy rain.
- In October, over just three days, 655,000 megalitres flowed into the dam – that's the equivalent of 262,000 olympic sized swimming pools. Without the dam, and these controlled releases, this water would have flooded parts of Brisbane.
- South East Queensland has a history of back to back weather events, including 1974 and 1999. We must ensure that the flood compartment is emptied in controlled way, to make room for another event.
- Wivenhoe Dam has proven itself on a number of occasions and can be relied upon in even larger events, if operated properly. This is exactly what we are doing – why would we change, especially in this current wet period?

Background

- The drinking water compartment of Wivenhoe Dam can store 1.2 million megalitres.
- In accordance with the requirements of the *Water Supply Act 2008*, Seqwater maintains a comprehensive Dam Safety Management Program covering its 25 referable dams.
- The program ensures that each of its dams are operated and maintained in a manner that is both safe from a structural

perspective and minimises the dam failure risks associated with flood events.

- This includes making arrangements with local councils and emergency management agencies for appropriate response to dam safety emergencies including flood events.
- The program has been endorsed and approved by the Dam Safety Regulator and met the standards required by the Queensland Dam Safety Management Guidelines and the international ANCOLD Guidelines on Dam Safety Management.
- To further protect South East Queensland, the Water Grid also mobilises a Flood Control Centre during a flood event at North Pine, Somerset or Wivenhoe Dams. It operates 24 hours a day with teams of operators at each dam 24 hours a day managing releases.
- Once levels are reached in Wivenhoe which require controlled flood gate operations, release instructions are issues by the Flood Control Centre, which is part of the Water Grid.
- Prior to any releases, Seqwater advises relevant councils, including Brisbane City Council, of impending gate operations including release volumes. Regular contact is made with relevant councils during the duration of the release event.

- Councils, working with emergency services, have the responsibility for determining the extent of any impact and any actions that may be required including local bridge and road closures.
- The Water Grid continues to work closely with local councils regarding the likely impacts of these releases on surrounding areas which include the closure of crossings.
- It is anticipated that during a large flood similar in magnitude to that experienced in 1974, by using the SEQ Water Grid mitigation facility within Wivenhoe Dam, flood levels will be reduced downstream by an estimated 2 metres.

From:	Bradley John [redacted]
Sent:	Thursday, December 23, 2010 3:58 PM
To:	Barry Dennien [redacted]; Dan Spiller [redacted]
Subject:	FW: Current Rain and Flooding + Predictions for Xmas
Attach:	QEMR 1000 231210.pdf

John Bradley
Director-General
Department of Environment and Resource Management
Telephone: [redacted]
Email: [redacted]
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: [redacted]
Sent: Thursday, 23 December 2010 12:10 PM
To: Bradley John; Wall Terry; [redacted] Brown Damien; [redacted] Best Debbie
Cc: [redacted] Allen Peter; [redacted]
Subject: Current Rain and Flooding + Predictions for Xmas

As you would no doubt be aware there has been significant rain over much of Queensland during December and this is not predicted to abate over the coming week or more. Attached is the latest daily report from Emergency Management Queensland. Of note is more local disaster groups moving to alert. The state disaster co-ordination centre is also holding daily teleconferences which DERM is participating in.

At today's teleconference the news was mostly rain related with a tropical low (not cyclone) likely to cross the coast north of Cairns sometime tomorrow. This will produce very heavy rain between Townsville and Cairns (ie south of the centre of the low). This will extend to areas north of Rockhampton late on Friday. Heaviest rain in the South East is likely to be late Saturday and into Sunday and then showers and storms next Tuesday/Wednesday. Most of the heaviest rains will be coastal (east of the ranges) and there is chance the falls will exceed 100mm each day of rain. Certainly the case in the tropics.

I would encourage you to ensure that you and key staff have the latest copy of the emergency contacts list with you over the Xmas break should we need to respond in any way.

Thanks

[redacted]
Director, ICT Infrastructure
Department of Environment and Resource Management
SDCG Rep

[redacted]

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

Emergency Management EMQ Queensland

Queensland Government

DEPARTMENT OF COMMUNITY SAFETY

Daily Queensland Emergency Management Report as at 1000 hours Thursday 23 December 2010

TROPICAL CYCLONE 3-DAY OUTLOOK

Queensland

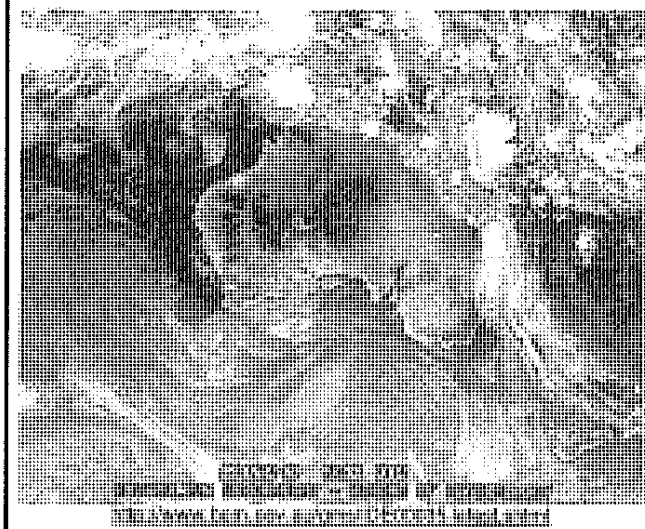
(issued 2:30 Wednesday, 22 December 2010)

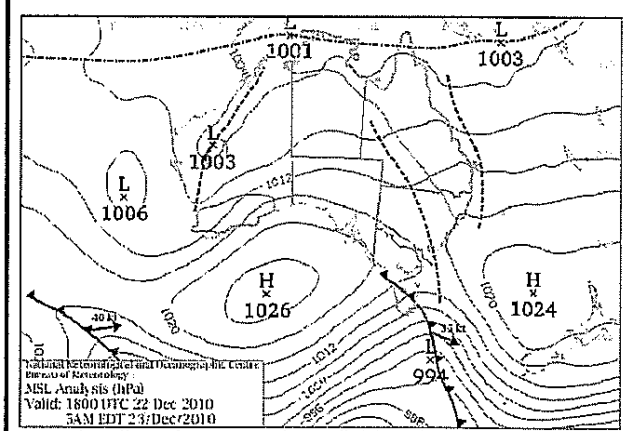
- A weak low over the northern Coral Sea, east of PNG, is forecast to move in a west southwest direction towards the north Queensland coast over the next few days. The most likely scenario is that the system will remain as a monsoon low as the monsoon trough establishes itself in the region by the weekend.
- Likelihood of a tropical cyclone developing in the Eastern Region on:
  - Thursday: Very low
  - Friday: Low
  - Saturday: Low

Darwin, NT

(issued at 2:15pm CST Wednesday 22 December 2010)

- Existing Cyclones in the Northern Region and Gulf of Carpentaria: Nil.
- Potential Cyclones: The monsoon trough lies across northern Australia with a weak low pressure system over the western Top End. The low is expected to move westward over the Timor Sea. Another weak low may form in the Gulf of Carpentaria during the weekend. Likelihood of a tropical cyclone being in the region over the next three days is Low.





http://www.bom.gov.au/australia/charts/synoptic_col.shtml

CURRENT SEVERE WEATHER WARNINGS AND SITUATION

- Flood warnings are current for the Barcoo, Bulloo, Condamine, Balonne, Warrego, Fitzroy River basin, Burnett Catchment, Cooper Creek, Tully and Murray Rivers and Adjacent Coastal Rivers.
- A Severe Thunderstorm Warning is current for flash flooding for people in parts of the Northern Tropical Coast and Tablelands and Herbert and Lower Burdekin Forecast Districts.

WEATHER SITUATION

- A weak ridge extends along the southern and central coast of Queensland, while a trough is located offshore in the Tasman Sea. A weak monsoon trough extends across northern Cape York Peninsula. A monsoon low will develop on the trough during Thursday.
- Showers and thunderstorms over northern and eastern parts of the state, increasing to rain at times with some moderate to locally heavy falls. Fine in the Channel Country. Scattered showers and thunderstorms elsewhere. Mostly moderate SE to E winds, fresh at times about the central east coast.

G61

WEATHER FORECASTS

- **Friday:** The monsoon low will move close to the north tropical coast by evening. Rain areas with moderate to heavy falls will increase over the southeast of the state and the southeast tropics. The heavy falls will become focused mostly about the tropical coast to the northern Capricornia area. Showers and thunderstorms will continue over the remaining tropics and develop over the southwest. Monsoonal rain areas will develop over Cape York Peninsula. Light to moderate W to NW winds will occur over the far northern tropics. Light to moderate SE to E winds will occur elsewhere and become fresh on the east coast.
- **Saturday:** The monsoon low will move into the southern tropical interior and weaken, whilst another monsoon low is expected to develop on the trough in the Gulf of Carpentaria. So further rain areas with widespread moderate to heavy falls will occur generally over the southern tropics and most of the southeast of the state. Showers and thunderstorms will occur elsewhere over the state with monsoonal rain over Cape York Peninsula. Moderate to fresh W to NW winds will occur over the northern tropics with strong winds developing over the northern Gulf of Carpentaria. Moderate to fresh SE to NE winds will occur over much of the remainder of the state and again will be strong on the tropical and Central Coast.
- **Sunday:** A surface trough is expected to lie from the northwest of the state into the Warrego. Further rain areas with widespread moderate to heavy falls will occur to the north and east of the trough. Monsoonal rain will continue over Cape York Peninsula. A clearance is expected in the far southwest of the state with drier southerly winds behind the trough. Moderate to fresh NE to NW winds will occur in the north and east of the state, possibly becoming strong near the coast.

WEATHER OUTLOOK

- A new upper trough is expected to amplify across southeastern Australia on Monday and persist across the west of the state through the outlook period. So further rain, showers and thunderstorms are likely to continue over much of the north and east of the state with the southwest of the state expected to remain fine.

SUMMARY OF WARNINGS

Date	Warning Type	Number of Warnings	Regions Affected
23/12	Flood	4	Central, South Western, Far Northern and South Western
23/12	Severe Thunderstorm	3	Far Northern and Northern
22/12	Flood	6	South Western, North Coast, Central, Brisbane and South East

CALLS MADE TO SES 132500 FROM 0500 Wednesday, 22 December to 0500 Thursday, 23 December 2010

Total Calls Made	Areas Of Note	
	Area	No of Calls
273	Brisbane	42
	Mackay	15
	Chinchilla	13

SES OPERATIONAL ACTIVITY

Region	Number (Date) of Activation	Number of SES Turnouts	Activity	Area Affected (SES Group)
Far Northern	1 (22/12)	6	Storm Damage Operations	Innisfail
	1 (22/12)	4	Storm Damage Operations	Mission Beach
Northern	Nil reported			
Central	1 (22/12)	4	Sandbagging	Marani
	1 (22/12)	4	Sandbagging	Gracemere
	2 (22/12)	8	Sandbagging	Calliope
	1 (22/12)	4	Sandbagging	Mt Larcom
	1 (22/12)	4	Floodboat Operations	Taroom
	1 (22/12)	4	Floodboat Operations	Rolleston
	1 (22/12)	4	Floodboat Operations	Blackall

Region	Number (Date) of Activation	Number of SES Turnouts	Activity	Area Affected (SES Group)
North Coast	1 (23/12)	14	Land Search	Noosa (7) & Maroochydore (7)
	1 (23/12)	6	Sandbagging	Nanango
	1 (23/12)	2	Floodboat Operations	Gin Gin
	1 (22/12)	5	Traffic Control	Blackbutt,
	1 (22/12)	2	Storm Damage Operations	Monto
	4 (22/12)	8	Storm Damage Operations	Nanango (2) Maleny (4) & Howard (2)
	2 (22/12)	5	Storm Damage Operations	Maryborough (4) & Bundaberg (1)
	3 (22/12)	6	Storm Damage Operations	Caloundra
	1 (22/12)	6	Floodboat/Resupply	Murgon
	1 (22/12)	5	Floodboat/Ferry	Gin Gin
	12 (22/12)	10	Storm Damage Operations	Hervey Bay (5) & Gympie (5)
	1 (22/12)	32	Land Search	Noosa, Caloundra, Maleny, Coolum, Nambour & Maroochydore
Brisbane	1 (22/12)	2	Floodboat Operations	Brisbane
South Western	1 (23/12)	4	Temporary Roof Repairs	Gatton
	1 (23/12)	5	Temporary Roof Repairs	Laidley
	1 (22/12)	4	Traffic Management	Dalby
	1 (22/12)	12	Sandbagging	Chinchilla
	1 (22/12)	2	Storm Damage Operations	Inglewood
	1 (22/12)	6	Storm Damage Operations	Dalby
South Eastern	10 (22/12)	6	Storm Damage Operations	Logan
	6 (22/12)	12	Storm Damage Operations	Ipswich
TOTALS	**62**	**196**		

MEDIA REPORTS

Thurs 23 December, The Courier Mail reports:
BRISBANE residents face more localised flooding this morning as the big wet continues across the state. http://www.couriermail.com.au/news/features/localised-flooding-for-brisbane-as-queesland-to-receive-christmas-deluge/story-e6freorf-1225975200617

DISASTER MANAGEMENT SYSTEM ACTIVATION STATUS AND KEY ACTIVITIES

- **LDMG activations:** Rockhampton - Alert
  Quilpie - Alert
  Roma – Alert
  Murweh - Stand up (Level 1)
  Chinchilla – Stand up (Level 1)
  Brisbane – Leaning forward (Level 1)
  Moreton – Alert
  Redlands – Alert
- **DDMG activations:** Brisbane – Leaning forward (Level 1)
  Redcliffe – Alert
- **SDCC activation:** Leaning Forward

NEXT REPORT

- The next Queensland Emergency Management Report will be issued at 1000 hours Friday, 24 December 2010 .

The QEMR is issued under the authority of the
Assistant Director-General, EMQ, Department of Community Safety

---

This document contains information on emergency management available to the State Disaster Coordination Centre at 0900hrs on the date of publication. The update is disseminated to assist in the coordination of emergency management responsibilities. The material contained in the update is provided by a range of sources as indicated. However, information obtained via open source may not be accurate and/or correct.

Emergency Management Queensland
Cnr Park Road and Kedron Park Road, KEDRON, Queensland
Telephone: 07 3247 8943 Fax: 07 3357 4682
Email: sdcc@dcs.qld.gov.au; with a copy to sdcckedron@hotmail.com

From: Bradley John [redacted]
Sent: Friday, December 24, 2010 12:45 PM
To: [redacted]
Cc: Dan Spiller [redacted], Barry Dennien [redacted]
Subject: RE: Rain Event Update

Thanks for all your help Michael – can you please copy in Dan Spiller and barry Dennien as attached to these circulars too ? appreciated

John Bradley
Director-General
Department of Environment and Resource Management
Telephone: [redacted]
Email: [redacted]
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: [redacted]
Sent: Friday, 24 December 2010 12:40 PM
To: Bradley John; Wall Terry; [redacted] Brown Damien; [redacted] Best Debbie; [redacted]
Cc: [redacted] Allen Peter [redacted]
Subject: Rain Event Update

A state disaster co-ordination teleconference was held at midday today about the current rain event across Queensland. The following updates information from yesterday

- A state disaster co-ordinator has been appointed – Deputy Commissioner Ian Stewart from Police
- The monsoonal low is expected to cross the coast north of Cooktown on Saturday (Christmas) morning. Heaviest rain is still expected between Cooktown and St Lawrence. Rain forecasts elsewhere are downgraded
- The South East can still expect moderate to heavy falls late Sunday and into Monday
- There are a number of road closures across Queensland. Please check http://131940.qld.gov.au/
- DERM provided input to the teleconference on dam storages and integrity. All are performing as designed at present. The riskiest dam, Middle Creek near Sarina is releasing to reduce current capacity.
- Daily sitreps will now be issued. I will pass those on.
- Daily teleconferences will now be held (including one at 10:30 tomorrow)

Thanks and have a safe and merry Xmas.

[redacted]
Director, ICT Infrastructure
Department of Environment and Resource Management

[redacted]

+----------+

Think B4U Print

1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere

3 sheets of A4 paper = 1 litre of water

+----------+

Litsupport Brisbane

From: Dan Spiller
Sent: Friday, 24 December 2010 2:54 PM
To: John Bradley [redacted]
Subject: FW: Kholo Bridge release and photos
Attachments: IMG_1431.JPG; IMG_1430.JPG; IMG_1432.JPG; IMG_1429.JPG

From: Dan Spiller
Sent: Friday, 24 December 2010 2:41 PM
To: stephen robertson [redacted] John Bradley [redacted] Debbie Best [redacted]
Cc: Barry Dennien; John Adcock; bob.reilly [redacted] Damien Brown [redacted] mfoster [redacted] Rob Drury [redacted]
Subject: Kholo Bridge release and photos

All,

Further to previous email, we have just received a copy of the draft release from BCC (see below). Reference to the bridge is factual.

Barry and I spoke to the CEO of BCC about flood impacts this morning, and I will continue to do so over coming days.

Photos are also attached.

Regards,
Dan

Tidal flooding continues but water levels decreasing

23 December, 2010

Minor tidal flooding again occurred in some areas of Brisbane earlier today due to a higher than usual tide, however water levels are starting to decrease from what was seen earlier in the week as part of the normal tide cycle.

Minor tidal flooding occurred today on roads, parks and bikeways in Albion, Newstead, Windsor, Bowen Hills and East Brisbane.

Roads affected included Waterloo and Ross Street in Newstead, Sandgate Road at Albion, and Windsor's Northey Street.

The roads affected today are expected to experience some tidal flooding tomorrow at high tide, which is due at 12.21pm (Brisbane Bar), and also possibly on Sunday.

Motorists are advised to avoid parking in the areas that may be affected by tidal flooding over the weekend and to be aware that some sections of these roads and bikeways may be closed to vehicles and bikes for a short period during and following the high tide peak.

Residents are also advised that Kholo Bridge on Kholo Road is currently closed due to major flood damage. Repairs will commence next week and the crossing is expected to reopen in the first week of January. Motorists will need to seek alternative routes while works are undertaken.

To find out where flooding may occur from creeks, rivers and storm tides, download the Flood Flag map for their suburb. These maps are free for download and are available from Council's website at www.brisbane.qld.gov.au/floodwise

For more information, phone Council on 3403 8888.

Litsupport Brisbane

From: Bradley John [redacted]
Sent: Friday, 24 December 2010 3:06 PM
To: Ken Smith
Cc: Dan Spiller
Subject: FW: Kholo Bridge release and photos
Attachments: IMG_1431.JPG; IMG_1430.JPG; IMG_1432.JPG; IMG_1429.JPG

Follow Up Flag: Follow up
Flag Status: Flagged

Ken

There has been major damage to Kholo's bridge as per Dan's email below.

Council officers originally had a release more blaming Seqwater releases but it has been toned down to the below.

The bridge outage is more of an inconvenience as I'm told there are other access options for residents.

John Bradley

Director-General

Department of Environment and Resource Management

Telephone [redacted]

Email [redacted]

www.derm.qld.gov.au

Department of Environment and Resource Management

400 George Street, Brisbane Q 4000

GPO Box 2454, Brisbane Q 4001

From: Dan Spiller [redacted]
Sent: Friday, 24 December 2010 2:41 PM
To: stephen.robertson [redacted] Bradley John; Best Debbie; [redacted]
Cc: Dennien Barry [redacted] adcock john [redacted] Reilly Bob; Brown Damien; mfoster [redacted] Rob Drury [redacted]
Subject: Kholo Bridge release and photos

All,

Further to previous email, we have just received a copy of the draft release from BCC (see below). Reference to the bridge is factual.

Barry and I spoke to the CEO of BCC about flood impacts this morning, and I will continue to do so over coming days.

Photos are also attached.

Regards,
Dan

Tidal flooding continues but water levels decreasing

23 December, 2010

Minor tidal flooding again occurred in some areas of Brisbane earlier today due to a higher than usual tide, however water levels are starting to decrease from what was seen earlier in the week as part of the normal tide cycle.

Minor tidal flooding occurred today on roads, parks and bikeways in Albion, Newstead, Windsor, Bowen Hills and East Brisbane.

Roads affected included Waterloo and Ross Street in Newstead, Sandgate Road at Albion, and Windsor's Northey Street.

The roads affected today are expected to experience some tidal flooding tomorrow at high tide, which is due at 12.21pm (Brisbane Bar), and also possibly on Sunday.

Motorists are advised to avoid parking in the areas that may be affected by tidal flooding over the weekend and to be aware that some sections of these roads and bikeways may be closed to vehicles and bikes for a short period during and following the high tide peak.

Residents are also advised that Kholo Bridge on Kholo Road is currently closed due to major flood damage. Repairs will commence next week and the crossing is expected to reopen in the first week of January. Motorists will need to seek alternative routes while works are undertaken.

To find out where flooding may occur from creeks, rivers and storm tides, download the Flood Flag map for their suburb. These maps are free for download and are available from Council's website at www.brisbane.qld.gov.au/floodwise

For more information, phone Council on 3403 8888.

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

Litsupport Brisbane

From: Bradley John [redacted]
Sent: Friday, 24 December 2010 3:08 PM
To: Ken Smith
Cc: Dan Spiller
Subject: FW: Technical Situation Report and Kholo Bridge damage
Attachments: Technical Stuation Report W19.docx

Follow Up Flag: Follow up
Flag Status: Flagged

Ken

Further advice from Dan Spiller. (Note the WGM release issued this morning pasted below referred to Kholo's Bridge being reopened to traffic – but this was before the damage was identified. It has been superseded by the BCC release)

John Bradley
Director-General
Department of Environment and Resource Management
Telephone: [redacted]
Email: [redacted]
www.derm.qld.gov.au

Department of Environment and Resource Management
400 George Street, Brisbane Q 4000
GPO Box 2454, Brisbane Q 4001

From: Dan Spille[redacted]
Sent: Friday, 24 December 2010 2:41 PM
To: stephen.robertso[redacted] Bradley John; Best Debbie; [redacted]
Cc: Dennien Barry [redacted] adcock john @ [redacted] Reilly Bob; Brown Damien; mfoste[redacted] Rob Drury [redacted]
Subject: Technical Situation Report and Kholo Bridge damage

All,

The Wivenhoe Dam gate closed at 1pm today, with the dam just above FSL. Releases through the value will continue, with ongoing monitoring of inflows. Some more detail is contained in the attached technical report.

We have just been advised by BCC that Kholo Bridge has been severely damaged (I will forward photos seperately). They are preparing Community Service Announcement now claiming this is due to dam releases. The bridge will be unserviceable until early 2011.

We will try to work with BCC officers regarding the wording of the release. For this event, the flows were due to a combination of the gate opening and significant Lockyer Valley flows. Flows have been no more than in October. In October, College's Crossing was damaged with Ipswich City Council making public statements at that time. EMQ dealt with the claims for damages. Seqwater is not liable, provided it made releases in accordance with the management plan.

For information, today's media updates is below. With the gate now closed, we will only issue updates as the situation changes. (Aside from the release to the CM on Monday around the Wivenhoe Dam fact sheet.)

From today, I am A/CEO. Please call on [redacted] if you have any queries or require any further information.

Regards,
Dan

WEEKLY GRID UPDATE
FRIDAY 24 DECEMBER 2010

Please note, this will be the last formal update from the Water Grid team until Tuesday 4 January, unless there are significant changes to current operational procedures.

WATER GRID READY FOR HOLIDAY SEASON

Over the last few weeks, Water Grid operators have been managing controlled releases from the region's key storages to ensure the Grid is prepared for further rains this summer.

Water Grid spokesperson, Barry Dennien, said Brisbane's key storage, Wivenhoe Dam, has released more than 320,000 megalitres since the gates were opened earlier this month.

"With further rain expected this summer it is important we retain the dam at just below full drinking water supply level for the safety of South East Queensland," Mr Dennien said.

On top of storing 1.15 million megalitres of drinking water, Wivenhoe Dam can also temporarily store an additional 1.45 million megalitres, equal to 2.5 times the volume of Sydney Harbour.

"Although this may sound like a large flood buffer, Wivenhoe's flood storage compartment can fill in less than three days following heavy rainfall," Mr Dennien said.

"In fact, following heavy rainfall in October, Wivenhoe Dam received inflows equivalent to almost half the flood compartment capacity in just a few days.

"It is important for the flood storage compartment to be emptied through controlled releases following heavy rainfall and inflows into the dam. As a result of the recent releases, the flood compartment is now empty, ready for any inflows over the holiday season."

DAM RELEASES

As at 8am today the following water releases are being made: Please note that the release strategy may change according to weather conditions.

One gate at Wivenhoe Dam remains open, releasing a daily average of around 30,000 megalitres.

Kholo Bridge and Burtons Bridge have re-opened to traffic. Twin Bridges, Savages Crossing and Colleges Crossing are currently closed.

Releases from Wivenhoe will continue over the holiday period depending on rainfall and inflows. Releases from other key storages may also occur depending on the weather.

Water Grid representatives have been working closely with councils since the releases from Wivenhoe and other dams began to ensure any likely impacts in surrounding areas were minimised.

Members of the public seeking information on potential impacts in their local areas, including road closures, should direct inquiries to their local councils.

For recorded information on current dam releases in South East Queensland, members of the public are encouraged to call **1800 613 122**.

For information on local flooding, including road closures, contact the local council or visit their website.

The council areas that are affected by Wivenhoe Dam releases are:

- Somerset Regional Council; 5424 4000; www.somerset.qld.gov.au
- Ipswich City Council; 3810 6666; www.ipswich.qld.gov.au
- Brisbane City Council; 3403 8888; www.brisbane.qld.gov.au

WEATHER CONSIDERATIONS FOR CAMPERS

Campers heading to South East Queensland dams are being urged to consider alternative arrangements this holiday season, with further wet weather expected over coming weeks.

Water Grid spokesperson Barry Dennien said every effort will be made to keep recreational sites open, however public safety is paramount.

"It is possible that some sites may be closed at short notice due to heavy weather and we are asking campers to explore other options."

The region's dam operators, Seqwater, are closely monitoring the levels, inflows and releases at all of South East Queensland's major dams.

Seqwater is offering a refund to those campers who wish to cancel bookings at Water Grid assets due to raised dam levels and flooding.

Mr Dennien said those campers wishing to continue with their plans are being advised that if lakes rise to unsafe levels, Seqwater rangers will be asking people to leave.

"Safety is a top priority for us, and we are asking members of the public to cooperate with all warnings and requests, to ensure everyone is kept safe."

Wivenhoe and Somerset dams are currently open for all water-based recreational activities, however this may change at short notice depending on weather.

The following recreation sites at Wivenhoe Dam remain closed:

- Billies Bay
- River access at Atkinsons Crossing

All other recreational sites have reopened however this status could change due to weather.

For more information on the status of Water Grid recreation sites visit www.watergrid.com.au

Some camping grounds are fully booked, but if further heavy rainfall is received, it may be necessary for one or more of the campgrounds to close. Please contact the operators of the various camp grounds of information specific to each site.

GRID TWELVE

The current supply capacity of the **Grid Twelve is 100.0 %**, no change from last week. The Grid Twelve makes up nearly 90 % of South East Queensland's total water storage volume. See below for further breakdowns:

Dam	**Current capacity** (%)	**Change in capacity on last week** (%)	**Rainfall** (mm over past seven days)
Wivenhoe	**100%**	No change	93mm
Somerset	**100%**	No change	111mm
North Pine	**97.0%**	2.6% ↓	86mm
Hinze	**97.2%**	3.6% ↑	73mm
Baroon Pocket	**100%**	No change	110mm
Leslie Harrison	**96.8%**	2.5% ↓	81mm
Ewen Maddock	**100%**	No change	134mm
Cooloolabin	**100%**	No change	149mm
Lake Kurwongbah	**100%**	No change	86mm
Lake MacDonald	**100%**	No change	109mm
Little Nerang	**100%**	No change	73mm
Wappa	**100%**	No change	149mm

The current supply capacity of the **Grid Three 3 (Wivenhoe, Somerset and North Pine) is 100 %**, no change from last week.

Note: The Grid Twelve and Grid Three % full is calculated by dividing the combined current storage volume of the dams in the group by the combined full storage volume.

DID YOU KNOW?

In times of heavy rainfall, the strategic management of dams is essential to assist in the protection of South East Queensland against flood. In accordance with the requirements of the Water Supply Act 2008, Seqwater, who are part of the Water Grid, maintains a comprehensive Dam Safety Management Program covering its 25 referable dams.

CONTACT DETAILS

Please direct all media enquiries to the Water Grid Communications Unit:

Phone (07) 3247 3000
Email: media@seqwgm.com.au
Website: www.watergrid.com.au

This email, together with any attachments, is intended for the named recipient(s) only; and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being

infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

```
+------------------------------------------------------------------+
Think B4U Print
1 ream of paper = 6% of a tree and 5.4kg CO2 in the atmosphere
3 sheets of A4 paper = 1 litre of water
+------------------------------------------------------------------+
```

TECHNICAL SITUATION REPORT

TSR Number	W19	Date of TSR release	24.12.2010	Time of TSR release	1.30pm

Seqwater status of inflows and dam operations

Current status but could change based on inflows or rainfall.

Current objectives	• Monitor the rain overnight and ongoing inflows.	
Strategy	• Close gates at Wivenhoe at 1.00pm • Wivenhoe continues to release 4,200ML per day through hydro and valves.	
Key considerations	Storage levels:	Just above FSL
	Inflows:	Ongoing base flows
	Rainfall:	
	Lockyer/Bremer:	Flows increasing. With further rainfall, may inundate local bridges with further rainfall.
	Brisbane River:	Any minor impact on tides still decreasing.

Somerset Dam

Sluice Gate and valve operations have ceased for the time being.

Wivenhoe Dam

Radial Gate operations ceased at 1.00pm.
A regulator and hydro will be opened to release around 4,200ML per day.

The Flood Centre will monitor overnight and consider options tomorrow morning based on inflows and rainfall.

Further gate operations may be necessary in coming days.

Impacts of Wivenhoe Dam Releases

Twin Bridges, Savages Crossing and Colleges Crossing may still be affected by flows from the Lockyer.

Seqwater Technical Officer name	Robert Drury
Seqwater Technical Officer position title	Dam Operations Manager
[redacted]	

BoM assessment

(consisting of references to latest Flood Warning for the Brisbane River and other relevant Bureau forecasts and warnings (e.g. weather/rain forecasts, Tropical Cyclone Warning etc) and other updates/comments if needed)

BoM has been advised.

BoM Technical Officer name	Peter Baddiley
BoM Technical Officer position title	
BoM Technical Officer contact details	[redacted]

Brisbane City Council (BCC) assessment

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

BCC Technical Officer name	Chris Lavin
BCC Technical Officer position title	Disaster Operations Manager
BCC Technical Officer contact details	[redacted]

Ipswich City Council (ICC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

ICC Technical Officer name	Tony Trace
ICC Technical Officer position title	Local Disaster Response Coordinator
ICC Technical Officer contact details	[redacted]

Somerset Regional Council (SRC) assessment (if required)

(to include predicted local inundation areas and depths of inundation based on the information)

Council has been advised and do not have a problem with the new strategy.

SRC Technical Officer name	Tony Jacobs
SRC Technical Officer position title	Local Disaster Response Coordinator
SRC Technical Officer contact details	[redacted]

Collated and distributed by (Agency)

Contact Officer signature	
Contact Officer name	Rob Drury
Contact Officer position title	Dam Operations Manager

Next TSR due	**Date**		**Time**		**or Event**	Gate opening

From: Dan Spiller [redacted]
Sent: Friday, December 24, 2010 4:38 PM
To: John Bradley [redacted]
Cc: Barry Dennien [redacted] Debbie Best [redacted]
Subject: FW: Rainfall outlook through New Year's Day

As discussed. Good summary of latest rainfall forecasts (and no bridge rage).

I will send more detailed advice this evening, with more information about tides and other questions raised this morning. I will share my advice with Colin also.

Dan

From: Colin Jensen [redacted]
Sent: Friday, 24 December 2010 4:21 PM
To: Dan Spiller
Cc: Chris Lavin [redacted]
Subject: Rainfall outlook through New Year's Day

Dan

As discussed, here is our latest view of the coming week - which seems to accord with what you are also being told.

Regards and Merry Christmas

Colin

LM

Following through on your information about 200mm of rain being forecast for New Year's Eve.

The FIC remains in contact with BOM. FIC have just spoken to BoM's meteorologist on duty this afternoon regarding the rainfall prediction over the coming week for the greater SEQ and Brisbane area. The meteorologist outlined that the latest rainfall prediction model shows rainfall is declining and the total rainfall to fall between now and New Years day to be a total of approximately 150mm. i.e. a total of approximately 150mm to fall, spread out, over the next 8 days.

FIC have also spoken with BoM's Flood Operations Centre regarding predictions of Brisbane River heights for the coming ten days (at my request). The BoM advised that they are monitoring the rainfall and BoM will provide detailed forecasts 3 days before any significant event. The BoM does not provide river flood forecasts greater than 3 days because of rainfall variability, prediction errors and a number of other variations.

At present, based on BoM's current rainfall prediction, the BoM is not undertaking river flood forecast modelling. During the coming days, if rainfall conditions are predicted to develop into a significant event, the BoM will undertake river flood modelling in conjunction with the FIC.

We will continue to actively monitor the situation

Merry Christmas

Colin

Colin Jensen
Chief Executive Officer
Brisbane City Council
GPO Box 1434 | Brisbane Qld 4001
Level 23, Brisbane Square | 266 George Street, Brisbane, Qld 4000
Phone: [redacted]
Email: [redacted]

****
This message has passed through an insecure network.
Please direct all enquiries to the message author.
****

From: [redacted] on behalf of Dan Spiller [redacted]
Sent: Tuesday, January 11, 2011 9:04 PM
To: Ken Smith [redacted]; Dan Spiller [redacted]; 'Martin.Peter [redacted]
Cc: 'John.bradley [redacted]; Barry Dennien [redacted]; 'dawson.alistair [redacted]
Subject: RE: Request for logistic support - SEQ Water Grid

Ken,

Seqwater has been able to access a commercial helicopter for the day. That will be sufficient for the survey of reservoirs.

We will still require assistance with the supply of bottled water, and will continue to liaise with SDCC about that.

Thanks for your assistance.

Dan

From: Ken Smith [redacted]
Sent: Tuesday, 11 January 2011 7:06 PM
To: Dan Spiller; 'Martin.Peter [redacted]
Cc: 'John.bradley [redacted]; Barry Dennien [redacted]; 'dawson.alistaire [redacted]
Subject: Re: Request for logistic support - SEQ Water Grid

Dan

I will take up these logistical support issues with aAsst commissioner Alistair Dawson

---

From: [redacted]
To: Peter Martin [redacted]
Cc: Ken Smith; john.bradley [redacted]; Barry Dennien [redacted]
Sent: Tue Jan 11 19:00:36 2011
Subject: FW: Request for logistic support - SEQ Water Grid

All,

As noted below, there are a number of stand-alone towns in the Scenic Rim and Somerset areas that have run out of supply or are expected to do so tomorrow.

Most of these towns are isolated. While we have tanker trucks on standby, these cannot access the areas. We also cannot access the reservoirs to confirm the amount in storage and the need and priority to supply of bottled water.

Our recommendation is that a helicopter be prioritised to early tomorrow to:

- transport operators to the Kilcoy site, which should be able to recommence supply (avoiding the need for air supply of bottled water)
- transport a QUU and a Seqwater officer to other isolated towns, allowing them to confirm remaining reservoir levels and provide advice and the need for supply of bottled water.

We are preparing a proposed itinerary and timetable.

We appreciate that these resources will need to prioritised against other needs. We appreciate your advice and assistance.

We are receiving good support on a number of other issues.

Regards,
Dan

From: [redacted]
Sent: Tuesday, 11 January 2011 6:46 PM
To: [redacted]
Cc: SEQWGM Emergency; Dan Spiller
Subject: FW: Request for logistic support - SEQ Water Grid
Importance: High

Further to the below, please find attached the latest update. Please note that Fernvale a sub-district of Lowood is now out of water. It is the highest priority for resupply of potable water within the attached list.

We do not have any internal capacity to carry out the resupply to Fernvale as it is cut off by road.

Please acknowledge receipt and do not hesitate to contact our Emergency Manager on [redacted]

Regards,

[redacted]
Duty Emergency Executive
M [redacted]

From: [redacted]
Sent: Tuesday, 11 January 2011 4:25 PM
To: [redacted]
Cc: SEQWGM Emergency

Subject: Request for logistic support - SEQ Water Grid

Per telecom at 1605hr, please find attached a log of requested support tasks consisting of 5 towns requiring the supply of potable water (thru tanker or bottled water), and one water treatment plant requiring a resupply of lime.

The attachment includes detail of the time-line for supply of water to townships, base d on what remains within the reservoirs at present.

With regards to the Water Treatment Plant, we have procured some lime, but are unable to get it to the plant. The plant supplys approx 40,000 pers on the Sunshine Coast, and will fail within 24 hours.

Included in the attachment are the contact details for personnel at a local level best able to answer queries and to coordinate movements and local support.

Regards

[redacted]
Duty Emergency Executive
M[redacted]

This email, together with any attachments, is intended for the named recipient(s) only, and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email is intended only for the addressee. Its use is limited to that intended by the author at the time and it is not to be distributed without the author's consent.

Unless otherwise stated, the State of Queensland accepts no liability for the contents of this email except where subsequently confirmed in writing. The opinions expressed in this email are those of the author and do not necessarily represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.

From: Dan Spiller [redacted]
Sent: Tuesday, January 11, 2011 10:40 PM
To: Ken Smith [redacted] 'Martin.PeterJ [redacted]
Cc: 'John.bradley [redacted] Barry Dennien <Barry.Dennien [redacted] 'dawson.alistair [redacted]
Subject: RE: Request for logistic support - SEQ Water Grid

All,

A helicopter has been arranged through

Thank you for your assistance

Regards,
Dan

From: Ken Smith [redacted]
Sent: Tuesday, January 11, 2011 7:06 PM
To: Dan Spiller; 'Martin.Peter.J [redacted]
Cc: 'John.bradley [redacted] Barry Dennien; [redacted]
'dawson.alistair [redacted]
Subject: Re: Request for logistic support - SEQ Water Grid

Dan

I will take up these logistical support issues with a\asst commissioner Alistair Dawson

---

From [redacted]
To: Peter Martin [redacted]
Cc: Ken Smith; John.bradley [redacted] Barry Dennien [redacted]
Sent: Tue Jan 11 19:00:36 2011
Subject: FW: Request for logistic support - SEQ Water Grid

All,

As noted below, there are a number of stand-alone towns in the Scenic Rim and Somerset areas that have run out of supply or are expected to do so tomorrow.

Most of these towns are isolated. While we have tanker trucks on standby, these cannot access the areas. We also cannot access the reservoirs to confirm the amount in storage and the need and priority to supply of bottled water.

Our recommendation is that a helicopter be prioritised to early tomorrow to:

- transport operators to the Kilcoy site, which should be able to recommence supply (avoiding the need for air supply of bottled water)
- transport a QUU and a Seqwater officer to other isolated towns, allowing them to confirm remaining reservoir levels and provide advice and the need for supply of bottled water.

We are preparing a proposed itinerary and timetable.

We appreciate that these resources will need to prioritised against other needs. We appreciate your advice and assistance.

We are receiving good support on a number of other issues.

Regards,
Dan

From: [redacted]
Sent: Tuesday, 11 January 2011 6:46 PM
To: [redacted]
Cc: SEQWGM Emergency; Dan Spiller
Subject: FW: Request for logistic support - SEQ Water Grid
Importance: High

Further to the below, please find attached the latest update. Please note that Fernvale a sub-district of Lowood is now out of water. It is the highest priority for resupply of potable water within the attached list.

We do not have any internal capacity to carry out the resupply to Fernvale as it is cut off by road.

Please acknowledge receipt and do not hesitate to contact our Emergency Manager on [redacted]

Regards,

[redacted]
Duty Emergency Executive
[redacted]

From [redacted]
Sent: Tuesday, 11 January 2011 4:25 PM
To: 'sdcclog [redacted]
Cc: SEQWGM Emergency
Subject: Request for logistic support - SEQ Water Grid

Per telecom at 1605hr, please find attached a log of requested support tasks consisting of 5 towns requiring the supply of potable water (thru tanker or bottled water), and one water treatment plant requiring a resupply of lime.

The attachment includes detail of the time-line for supply of water to townships, base d on what remains within the reservoirs at present.

With regards to the Water Treatment Plant, we have procured some lime, but are unable to get it to the plant. The plant supplys approx 40,000 pers on the Sunshine Coast, and will fail within 24 hours.

Included in the attachment are the contact details for personnel at a local level best able to answer queries and to coordinate movements and local support.

Regards

[redacted]

Duty Emergency Executive
M[redacted]

This email, together with any attachments, is intended for the named recipient(s) only, and may contain privileged and confidential information. You understand that any privilege or confidentiality attached to this message is not waived, lost or destroyed because you have received this message in error. If received in error, you are asked to inform the sender as quickly as possible and delete this email and any copies of this from your computer system network.
If not an intended recipient of this email, you must not copy, distribute or take any action(s) that relies on it; any form of disclosure, modification, distribution and/or publication of this email is also prohibited.
While all care has been taken, the SEQ Water Grid Manager disclaims all liability for loss or damage to person or property arising from this message being infected by a computer virus or other contamination. Unless stated otherwise, this email represents only the views of the sender and not the views of the SEQ Water Grid Manager and/or the Queensland Government.

This email is intended only for the addressee. Its use is limited to that intended by the author at the time and it is not to be distributed without the author's consent.

Unless otherwise stated, the State of Queensland accepts no liability for the contents of this email except where subsequently confirmed in writing. The opinions expressed in this email are those of the author and do not necessarily represent the views of the State of Queensland. This email is confidential and may be subject to a claim of legal privilege.

If you have received this email in error, please notify the author and delete this message immediately.

From:	Dan Spiller [redacted]
Sent:	Wednesday, January 12, 2011 8:12 AM
To:	Barry Dennien [redacted] 'john.bradley [redacted]
Subject:	Water conservation

Barry and John,

We are anxious that there be a water conservation message across SEQ. We can maintain levels at current demands, but will have problems at this stage if demand increases significantly.

The key constraints are:

- The pump station at the Mt Crosby East Bank WTP is likely to be flooded, meaning that it will be offline. The time that it is offline depends upon whether the electrics are flooded
- Output from the Mt Crosby West Bank WTP and North Pine WTP is currently constrained due to poor water quality. We expect that West Bank will be limited to 125 ML/day for several days. This compares to its typical output of about 200 Ml/day.

The capacity constraints may be short-term only, but there has not yet been evidence of any improvements in water quality.

Given these constraints, the current water balance in the central are (Brisbane, Logan and Ipswich) is supply of 320 ML/day and typical demand of 340 to 360 ML/day. We can manage this demand based on storage (Linkwater and QUU reservoirs remain high) but any significant increases in demand would be a concern.

There is also confusion about water quality across the region.

DREs are agitating and will go above the line - QUU is proposing to brief the LM. I would prefer a coordinated whole of Grid approach.

Regards,
Dan

From: Dan Spiller [redacted]
Sent: Thursday, January 13, 2011 3:03 AM
To: 'Bradley John' [redacted]
Subject: FW: draft Media Release
Attach: MEDIA RELEASE_Residents and Businesses urged to use water wisely_13 January 2011.doc

---

For your approval.

From: WaterGridMedia [redacted]
Sent: Thursday, January 13, 2011 3:01 AM
To: Dan Spiller
Subject: draft Media Release

Dan

Draft approved by Qld Health for on forwarding and approval to John Bradley and [redacted]

Regards
John

This e-mail, including any attached files, may contain confidential and privileged information for the sole use of the intended recipient. Any review, use, distribution, or disclosure by others is strictly prohibited. If you are not the intended recipient (or authorized to receive information for the intended recipient), please contact the sender by reply e-mail and delete all copies of this message. Queensland Bulk Water Transport Authority (trading as LinkWater). This email is copyright. LinkWater is not liable if an attachment is altered without its written consent and does not accept liability in connection with the transmission of information using the internet. This notice should not be deleted or altered.