Suzie Emery

From: Peter Borrows [pborrows[redacted]
Sent: Sunday, 16 January 2011 9:33 PM
To: Barry Dennien
Cc: Peter Borrows; Rob Drury; Duty Seq
Subject: Fw: Cabinet in co nfidence - Ministerial brief outline
Attachments: WGM Brief with replies.docx; WGM Report with replies.docx; Ministerial Briefing Note January 17 2011 Final Draft for distribution.doc; Jan 2011 Flood Event_Ver 1_draft for distribution.docx

Barry, a lot of the extra questions will have to be picked up after the event in an interim or final report.

Sorry it has taken so long.

I think everyone is taking longer now.

Peter

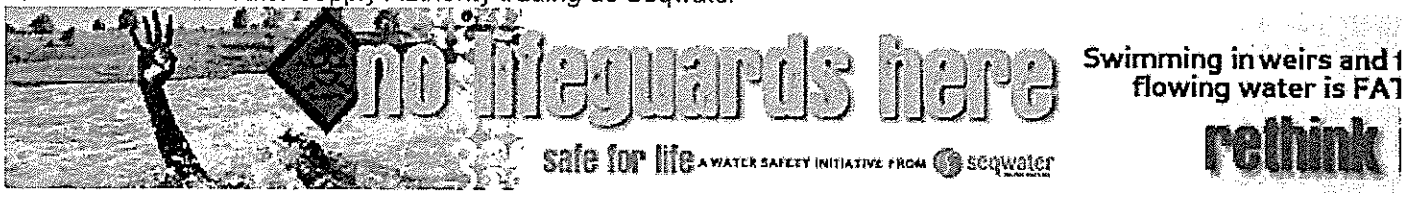
From: Rob Drury
To: Peter Borrows
Cc: John Tibaldi; Paul Bird
Sent: Sun Jan 16 21:20:33 2011
Subject: FW: Cabinet in co nfidence - Ministerial brief outline

Peter,

- Below is a reply to Bob covering most of his comments. Some have been included in the updated Brief and Report and others explained.
- Attached is an updated copy of the Report and the Brief with some minor changes. Most changes are in the fuse plugs and the Report section at the end
- Copies of the WGM comments named appropriately with our comments in red as to whether we made changes or reasons why we didn't. if we said reasons why we couldn't, we did not change the brief or Report in that area.

Rob

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



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WATER FOR LIFE

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From: Peter Borrows
Sent: Sunday, 16 January 2011 6:06 PM
To: Rob Drury
Cc: John Tibaldi; Paul Bird; Jim Pruss; Peter Borrows
Subject: Fw: Cabinet in co nfidence - Ministerial brief outline

Have a look.

I'll call in a while. You'll have to get input from John T I think.

From: Kathy Reilly <threereillys[redacted]>
To: Reilly Bob <Bob.Reilly[redacted]>; Peter Borrows; john.bradley[redacted]
<john.bradley[redacted]>; barry.dennien[redacted] <barry.dennien[redacted]>;
dan.spiller[redacted] <dan.spiller[redacted]>; peter.allen[redacted]
<peter.allen[redacted]>
Sent: Sun Jan 16 17:59:36 2011
Subject: Re: Cabinet in co nfidence - Ministerial brief outline

Hi Peter

Peter Allen will provide you with some technical commentary, so I will concentrate on the wider issues. In the interests of time, I have not checked my comments with Peter Allen so he and your staff can feel to correct me if I have got my facts wrong.

Dam failure versus fuse plug activation

In the current event, the critical issue we were trying to avoid was activation of the fuse plugs, with the first one being activated at (I recall) 75.6 metres--not sure what this was in terms of percentage of capacity. As well as the adverse impacts of such activation cited in the text, the practical effect would also have been to increase, I understand, flood heights by about 0.5 metres in Brisbane. So, we had to avoid this outcome. (Also what the 0.5 metres been worth in terms of avoided property damage?)

This is not necessarily correct, the main reasons are as per the document rather than a 0.5m increase as we could shut down gates, although this again increases the levels to make up for the fuse plug flow.
Personally, I would emphasise more the arguments around what we had to do to avoid this outcome.

Reducing the peak flood in brisbane--last paragarph p.3

This is an important point. However the argument would be strengthened if you more comprehensively explained the reasoning behind the statement. For example, are we saying that because seqwater reduced the flow from 6,000 cumecs to 2,500 cumecs, then this was the outcome, and that the only reason we could do that was because we were still 0.5 metres or so below fuse plug activation (and thus had a buffer if there was an unexpected surge in inflows?) We really did this because we managed to stop the increase in the dam rising. Did try to cover this in the report.

Also what is the 1 metre worth in terms of reduced property damage?Haven't been able to quantify this yet.

Section 2.4

Playing the devil's advocate for a moment with respect to the table on p.7, could someone convincingly argue that if the starting level had been 50% of FSL, you would have had the ability to reduce the releases from Wivenhoe below 2,500 cumecs at the height of the flood event, and thus further reduce the peak height in Brisbane /Ipswich?
Possibly, but at no stage had 50% reduction in Wivenhoe been seriously canvassed by Govt nor could we have probably got to 50% after every event.

Seqwater report (p.13)

The specific additional issues that I suggest we include are:

- whether it is worth investigating increasing the flood capacity of Wivenhoe--I know a fair bit of work has been done on this issue
- whether the Brisbane River crossings which act, under some situations as a constraint on the releases from Wivenhoe, should be replaced by bridges. For example if the smallest could pass , for example, 2,500 cumecs, then this could enable higher releases under some circumstances.
- Whether the policy of draining the flood compartment within 7 days should be modified.

Included in report.

I also suggest the review be undertaken by an independent expert and that an expert panel be formed to provide review of the report and identification of any additional issues requiring investigation--this is important if you are picking up possibel improvement by otehr agencies.

Left out of report as a decision not by Seqwater.

Minor points.

- throughout the text can we be clear what we mean by the term "failure"--to the Minister I suspect this means the dam will collapse and I do not think this is what meant in some cases.
- the spillway upgrade in 2035 is not intended to improve flood mitgation capacity, I understand (p.2)
- the first few paragraphs in section 2.1 refer to the sceanrio where Wivenhoe did not exist--could this be made clearer in the text?
- Finally, could we make the point that Wivenhoe/Somerset does not control Lockyer/Bremer and that the flood flow at the river peak was compromised of x % from these sources. In the last few days, I have explained to many people around Milton/Auchenflower (where there was significant flooding) this point and they are always surprised. There appears to be a strong view in the community that Wivenhoe was supposed to stop any repetition of the 1974 flood and therefore it "failed" in this task given what has happened.

Most of these comments included but we cannot split up what source contributes what levels downstream without serious analysis of the whole system. Best estimate the BoM came up with was 50% but that was just an estimate however we agree.

Bob

----- Original Message -----
From: Reilly Bob
To: threereillys [redacted]
Sent: Sunday, January 16, 2011 4:33 PM
Subject: Fw: Cabinet in co nfidence - Ministerial brief outline

----- Original Message -----
From: Peter Borrows <pborrows [redacted]
To: Reilly Bob; Rob Drury <rdrury [redacted]>; Duty Seq <dutyseq [redacted]>; Bradley John; Dennien Barry [redacted]; spiller daniel [redacted]
Cc: Lyons Michael [redacted]; Mike Foster <mfoster [redacted]>; Elaina Smouha <elainamir [redacted]>; Allen Peter
Sent: Sun Jan 16 16:28:29 2011
Subject: Cabinet in co nfidence - Ministerial brief outline

Please see attached draft with attachment.

In relation to the draft contents outline sent yesterday, the following is a cross reference FYI.

The attached Ministerial Briefing Note addresses the questions contained in the Ministerial Information Request as follows:

1) Design of Dam – Storages/Spillway upgrade

Refer Section 1

2) "The Flood Event" – Q&A

a. Chronology - High level time step of events and significant decision making/changes – more detailed time step information for Tuesday afternoon (i.e. what was the BOM forecast at the time, narrow peak etc.)

Refer Section 2.5

b. How does Wivenhoe Dam work as a flood mitigator?

Refer Sections 2.1, 2.3 and 3.1

c. What are the factors being balanced when making decisions about the amount of dam releases? To what extent does information from the Bureau of Meteorology/rain gauges influence decisions? How reliable is this information?

Refer Sections 3.1 and 3.2

d. Statistics on how much did Wivenhoe Dam knock off the flood peak.

Refer Section 2.1

e. What would have happened if Wivenhoe Dam had not been built and we only had Somerset Dam? What damage would have been caused compared to what has currently been experienced (damage statistics)?

Refer Sections 2.1 and 2.2

f. If we have undertaken pre-emptive dam releases to bring Wivenhoe Dam's full supply level down to lower than what we had maintained (i.e. 60%), what would have been the river height for the period that this flood event occurred?

Refer Section 2.4

g. If pre-emptive dam releases would not have made a difference, why? (i.e. why did we not release earlier?)

Refer Section 2.4

h. Why was Wivenhoe Dam only allowed to rise up to 191% and not 230%?

Refer Section 2.2

i. What is the fuse plug and why did it need to be maintained?

Refer Section 2.3

j. What damage or town isolation occurred during the Wivenhoe Dam releases that occurred since October 2010?

Refer Section 2.4

k. Did Seqwater have time to reduce the dam level between the 5 events? If so, would it have made a difference to this flood event?

Refer Section 2.4

3) The Flood Mitigation Manual

Refer Section 3.1

a. Describe the decision making framework - Four strategies

Refer Section 3.2

b. How is the Manual designed to work?

Refer Section 3.2

c. History of Flood Mitigation Manual updates and peer review – who was on the panels, studies that fed into previous versions of the Manual and who was involved in these studies?

Refer Section 3.1

4) Regulatory context - Water Supply (Safety and Reliability) Act 2008 (Information provider: Peter Allen - DERM)

Refer Section 4

Regards, Peter.

Peter Borrows

Chief Executive Officer

Queensland Bulk Water Supply Authority trading as Seqwater

[redacted] | E pborrows[redacted]

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From: Elaina Smouha [mailto:elainamir[redacted]
Sent: Saturday, 15 January 2011 5:03 PM

To: Mike Foster; peter.allen[redacted]; bob.reilly[redacted]; Peter Borrows; Rob Drury; Duty Seq
Cc: john.bradley[redacted]; barry.dennien[redacted]; daniel.spiller[redacted];
michael.lyons[redacted]; Elaina Smouha
Subject: Cabinet in confidence - Ministerial brief outline

Dear All

To assist, attached is a Ministerial brief outline as per our recent teleconference, for Monday's Emergency Cabinet meeting. It also records those who will be providing information for the Background and Flood Mitigation Manual report process.

As discussed, the brief needs to be provided to Minister Robertson tomorrow (Sunday, 16 January 2011).

Regards

Elaina

Elaina Smouha

Director, Governance and Regulatory Compliance

SEQ Water Grid Manager

[redacted]

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Ministerial Briefing Note

17 January 2010

Flood Event January 2011

1. BACKGROUND INFORMATION ON WIVENHOE DAM

2. WIVENHOE DAM FLOOD MITIGATION AND FLOOD OPERATIONS

2.1 What were the benefits provided by Wivenhoe Dam during the current event?

2.2 Why was Wivenhoe Dam only allowed to rise up to 191% and not 230%?

2.3 What is the role of the erodible fuse plug embankments?

2.4 Why weren't pre-emptive releases undertaken prior to the start of the flood event?

2.5 Is there a detailed record of the events associated with the current flood?

3. THE MANUAL OF OPERATIONAL PROCEDURES FOR FLOOD MITIGATION AT WIVENHOE DAM AND SOMERSET DAM

3.1 What is the Manual of Flood Mitigation and how was it developed?

3.2 What is contained in the Manual?

4. REGULATORY CONTEXT

5. COMPLIANCE WITH MANUAL

6. SEQWATER REPORT

1 BACKGROUND INFORMATION ON WIVENHOE DAM

Wivenhoe Dam was completed in 1984 and has two main functions;

- A 1,165,000 ML storage providing an urban water supply for Brisbane;
- Flood mitigation in the Brisbane River by providing a dedicated flood storage volume of 1,450,000 ML (this flood storage was increased in 2005 to 1,966,000 ML with the dam at the point of failure).

In accordance with the Queensland Regulatory program for dam spillway upgrades, a further upgrade of Wivenhoe Dam is scheduled to occur prior to 2035 but only for dam safety reasons in the event of a probable maximum flood and has no impact on the current event.

Wivenhoe Dam is in excellent condition with four Comprehensive Dam Safety reviews undertaken in the last 14 years, the latest in 2010.

2 WIVENHOE DAM FLOOD MITIGATION AND FLOOD OPERATIONS

2.1 What were the benefits provided by Wivenhoe Dam during the current event?

The following graphs demonstrate the significant benefits of Wivenhoe Dam in mitigating the current flood event, with reductions in flood peak from Wivenhoe Dam not existing of up to 2.5 metres in the City area and up to 5.5 metres in the Moggill area further upstream.

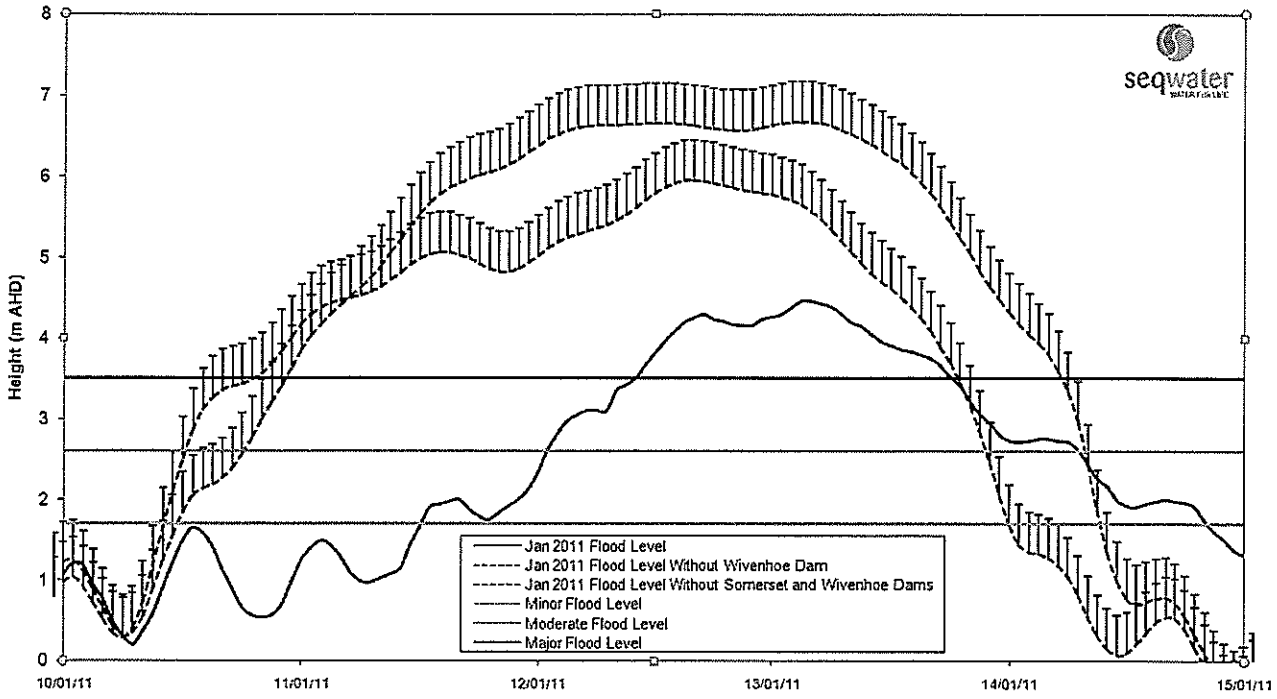
This equates to significant reduction in the potential for loss of life as well as saving in damages in the order of up to $1.6 billion based on current damage curves. Up to 13,000 more properties would have been impacted by the event without the Dam. (Source: Flood Damage Tables provided to Seqwater by the Brisbane City Council).

The time at which flood levels remained elevated above major levels has also been reduced by up to 3 days by the dam. This has significant benefits to impact on the population of the city, property damage and the recovery operation.

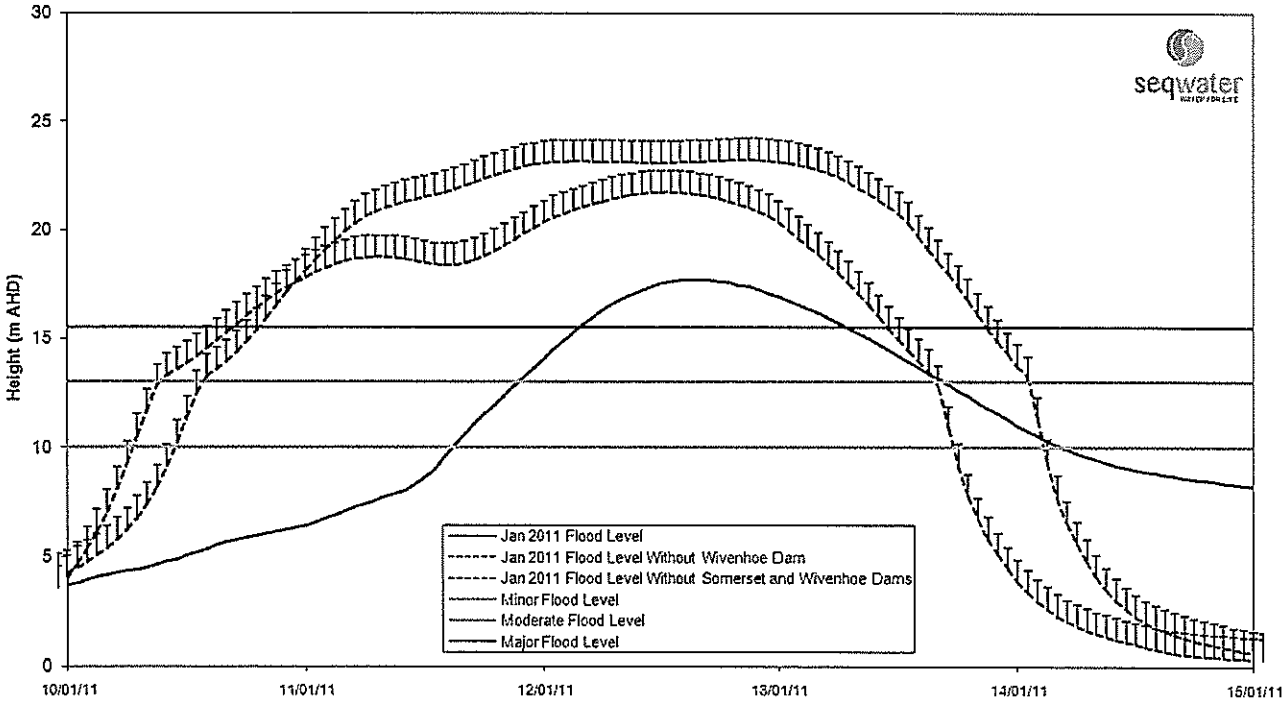
Depending on the nature of the event, the presence of Wivenhoe Dam could also potentially increase flood warning times to impacted areas. How these times may have been increased during the current event is presently difficult to quantify, but discussions will be held with BOM on this issue at a later date.

In addition, the strategy adopted to quickly close off releases once the peak in the dam had been reached and rain stopped falling certainly reduced the predicted flood peak by at least one metre in the lower Brisbane River area. This was carried out because the releases had stopped the dam from rising and careful monitoring allowed rapid reduction of releases while ensuring fuse plug initiation did not occur.

JANUARY 2011 BRISBANE FLOOD
Assessment of Flood Levels at Brisbane City



JANUARY 2011 BRISBANE FLOOD
Assessment of Flood Levels at Moggill



2.2 Why was Wivenhoe Dam only allowed to rise up to 191% and not 230%?

Wivenhoe Dam mitigates downstream flooding by storing incoming flood water during a rainfall event and releasing these waters at a reduced flow rate downstream to reduce flood impacts. The timing of the releases is also manipulated so that the aim is for outflows from the dams to impact on downstream areas only after the peak inflows from the downstream major tributaries have passed. However this aim cannot always be achieved in practice. This is because some large floods, such as the one currently being experienced, have the potential to overflow the dam's flood storage compartment. **Should this occur, the dam would fail and the resulting damage and loss of life would be at least 100 to 1000 times greater than that currently being experienced.**

Therefore the basis of all flood operation decision making is to ensure the dam never fails. This is the reason that the dam's flood storage compartment would never be intentionally fully filled as any additional inflows after this point would result in a dam failure. At any one time, there will always be uncertainty about what rain is going to occur. Hence, we cannot use all of the flood capacity as we would not be able to release sufficient water to cater for large inflows.

2.3 What is the role of the erodible fuse plug embankments?

Another factor that impacts on flood release decision making in large events are the levels at which the erodible fuse plugs are triggered. The fuse plugs act as a safety valve to rapidly increase dam outflows if the structural safety of the dam is in danger. Loss of one or more fuse plugs severely limits the ability of the dam to mitigate the effects of future flood events that may occur prior to the fuse plug or plugs being reinstated. Reinstatement of a fuse plug following an event would take a minimum of 4 to 6 months and would require an extended period of relatively dry weather.

2.4 Why weren't pre-emptive releases undertaken prior to the start of the flood event?

In the 25 days leading up to the current event, three flood events impacting on Wivenhoe Dam were experienced, with gate releases being made on all but five of those days. The total outflow from these events was around 700,000ML.

During these events, requests were received from Councils and residents impacted by bridge closures downstream of the dam to curtail releases as soon and as quickly as possible. Additionally the 2 January end date of the flood event prior to the current event meant that significant drain down of the dam prior to the onset of the current event that commenced on 6 January 2011, was not possible without major bridge inundation downstream of the dam and without exceeding minor flood levels in the lower Brisbane River.

Additionally, a flood event was also experienced in October 2010 that resulted in a release of 750,000ML from the dam. Accordingly drain down below the dam full supply level prior to the start of the first December event would not have been possible without significant bridge inundation and without exceeding minor flood levels (as defined by BOM and BCC) in the lower Brisbane River.

Regardless, significant drain down prior to the current event would have had little impact on the peak level in Wivenhoe Dam as shown in the table below. The reason for this is that this total event inflow volume of 2,600,000 ML is well in excess of the useable flood storage combined with the available water supply storages shown in the table.

The specific impact on the Lower Brisbane River of these reduced dam levels requires the use of a complex hydraulic model. The results of this modelling would still contain a degree of uncertainty as illustrated by the difficulties in estimating the final flood peak in Brisbane during the event. This is because the rapid closure of the gates after peak inflow was achieved resulted in significant water level reductions downstream and this is difficult to model accurately.

JANUARY 2011 FLOOD			
Starting Level		Peak Height	Capacity
%	m AHD	m AHD	%
100	67.0	74.97	191
95	66.5	74.93	191
90	65.8	74.88	190
75	64.0	74.63	187
50	60.0	74.11	180

It should be noted that the possible reductions shown above are based up a unique dual peaked flood hydrograph with a volume of about 2,600,000 ML which occurred during this event. A hydrograph with the same volume but a different distribution could result in a significantly lower reduction in peak water levels.
Flood operations at the dam are also highly dependent upon the flood inflow volume and a slight variation in the flood volume could significantly reduce the benefits associated with draining down the dam prior to a flood event.

2.5 Is there a detailed record of the events associated with the current flood?

A preliminary report has been prepared and is attached to this briefing.

3 THE MANUAL OF FLOOD MITIGATION AT WIVENHOE DAM AND SOMERSET DAM

3.1 What is the Manual of Flood Mitigation and how was it developed?

The Manual of Flood Mitigation for Wivenhoe and Somerset dams in its current form was developed in 1992 during an extensive hydrological study of the Brisbane and Pine Rivers catchments by DPI, Water Resources. The final reports were subject to extensive internal review by the Water Resources Group before being reviewed by an independent review panel comprising Professor Colin Apelt, Head of Department, Department of Civil Engineering, University of Queensland and Mr Eric Lesleighter, Principal Hydraulic Engineer and Chief Engineer Water Resources, Snowy Mountains Engineering Corporation. Subsequently, the Manual was extensively reviewed during the Brisbane Valley Flood Damages Minimisation Study in 2006, with the latest comprehensive review of the Manual undertaken in 2009. Both of these reviews have included expert review panels comprising key stakeholders, with the most recent review involving representatives from DERM, BOM, BCC and SunWater.

The Manual of Flood Mitigation is prepared by Seqwater as the owner of the dam and approved and gazetted by the Chief Executive of DERM in accordance with the Water Supply Act 2008. The manual defines flood objectives procedures; roles and responsibilities; and staffing and operational requirements for flood events impacting on Wivenhoe and Somerset dams.

3.2 What is contained in the Manual?

The primary objectives of the procedures contained in the Manual are, in order of importance:

- 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);
- 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.

During an event, the operation of the dam transitions between the following four operating strategies depending of the circumstances at the time. These procedures associated with these strategies are explained in detail in the Manual.

- **Strategy W1** – Primary consideration is given to Minimising Disruption to Downstream Rural Life.
- **Strategy W2** – Transition Phase moving from Minimising Disruption to Protecting Downstream Urban Areas.
- **Strategy W3** – Primary consideration is to Protect of Urban Areas from Inundation.
- **Strategy W4** – Primary consideration is to protecting the structural safety of the Dam.

In addition to these strategies, 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. Accordingly for each flood event, the aim is always to empty stored floodwaters within seven days after the flood peak has passed through the dams.

4 REGULATORY CONTEXT (Provided by Peter Allen and unedited)

These are contained in the Flood Mitigation Manual (manual) approved under sections 370 to 374 of the *Water Supply (Safety and Reliability) Act 2008.* The Chief Executive Officer (CEO) of DERM (or his delegate) approves the manual, and the approval is notified in the Queensland Government Gazette. Approval can be for a period of up to five years, after which the approval needs to be renewed. There are no decision-making criteria specified in the Act for the CEO to take into account when approving the manual.

The manual for the dams requires, amongst other matters:

1. Flood operations to be conducted in accordance with manual's provisions. (There is an approval process specified in the manual, if Seqwater considers a different flood release strategy is desirable to deal with a particular flood event. This was not used in the January 2011 flood event)
2. Flood operations to be under the control of CEO-approved engineers (who are highly qualified and experienced)
3. Annual reporting on the preparedness and status of the flood control system for flood operations, and the training of the personnel who manage the flood events.
4. Reporting on the flood operations during flood events.
5. Reviews after flood events such as the January 2011 event. For this flood event, the Queensland Government engaged Mr Brian Cooper, an independent consulting engineer, to review compliance with the manual. Mr Cooper concluded (Attachment??): "...The strategies in the Flood Mitigation Manual have been followed, allowing for the discretion given to make variations in order to maximise flood mitigation effects. The actions taken and decisions made during the Flood Event appear to have been prudent and appropriate in the context of the available knowledge available to these responsible for flood operations and the way events unfolded..." (p.3 of the final report or other appropriate reference??)

The manual is separate from a draft communication protocol (Insert name) between the Local, State and Commonwealth government agencies that are affected by the dams' flood operations. This protocol is not binding on the parties to it is not subject to regulatory approval/review.

Some DERM staff, because of their specialist skills, work in the Flood Operations Centre that Seqwater activates to manage such events. None of them are involved in any of the regulatory decisions concerning the dams or are members of the work unit (Office of the Water Supply Regulator) which undertakes the CEO's regulatory functions.

5 COMPLIANCE WITH THE MANUAL

(To be provided)

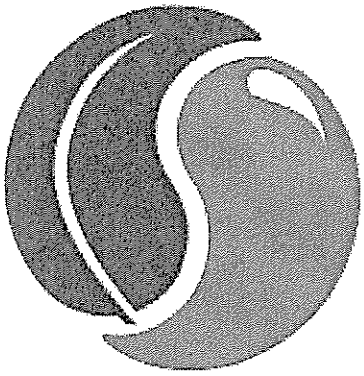
6 SEQWATER REPORT

It is recommended that the process and content for reports required for this event be:

- In the short term, utilise this report attached to this briefing note as the basis for communications and discussion.
- Prepare any Interim Reports as agreed to provide information and input as required.
- Seqwater prepare a Comprehensive Report as per the existing regulatory requirements of the Act and the gazetted manual and any requirements of the Dam Safety Regulator. This would be done within 6 weeks of the closure of the current event as per the manual. This timeframe is subject to any new mobilisation of the Flood Operations Centre. The Table of Contents would include:
    - Introduction
    - Flood Event Summary
    - Mobilisation and Staffing
    - Event Rainfall
    - Inflow and Release Details
    - Data Collection System Performance
    - Data Analysis Performance
    - Communication
    - Flood Management Strategies and Manual Compliance
    - Improvements in data collection systems, practices and processes.
    - improvements by interacting agencies
    - Review of factors impacting on the protection of urban areas
    - Recommendations & Conclusions
- The report would then be reviewed by the Dam Safety Regulator in conjunction with any peer review they require. The review should cover:
    - Were the provisions of the manual complied with?
    - What improvements to either facilities e.g. stream gauges, or work practices, are desirable to improve Sewater's ability to predict inflows into the dams.
    - Are improvements to either Seqwater's facilities or work practices desirable to improve Seqwater's ability to manage events? For example, investigations to raise the dam to improve its flood storage capacity, If so, what are they and their implications

- Are changes to the facilities or work practices of other organisations desirable to improve Seqwater's abilities to manage these events?
- whether it is worth investigating increasing the flood capacity of Wivenhoe
- whether the Brisbane River crossings which act, under some situations as a constraint on the releases from Wivenhoe, should be replaced by bridges. For example if the smallest could pass , for example, 2,500 cumecs, then this could enable higher releases under some circumstances.
- Whether the policy of draining the flood compartment within 7 days should be modified.
- Given the manual's order of priorities i.e. protection of the dam etc, are any changes in the flood release strategies for either dam desirable? If so, what are they, and their implications

- Based on this review, a review of the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam would occur utilising an expert panel of review including representatives of DERM, Seqwater, BoM, affected Local Governments and other stakeholders as necessary.



seqwater

WATER FOR LIFE

JANUARY 2011 FLOOD EVENT

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1 INTRODUCTION

Wivenhoe Dam was constructed by the Queensland Government between 1977 and 1984. The dam is a 56 m AHD high and 2.3 kilometre long earth and rock embankment separated into two parts by a concrete gravity spillway. The spillway is controlled by 5 radial gates, each 12.0 metres wide by 16.0 m AHD high. Two saddle dam embankments are located on the left side of the reservoir.

The dam spillway capacity was upgraded in 2005. This was done primarily through the construction of a 164 metre wide secondary spillway through the right abutment of the existing dam. This spillway contains three erodible earth fill fuse plug embankments that are initiated at different dam levels in excess of EL 75.6.

The dam has two main functions by providing:

- A 1,165,000 ML storage at full supply level (FSL EL 67.0) providing an urban water supply for Brisbane and surrounding areas;

- Flood mitigation in the Brisbane River by providing a dedicated flood storage volume of 1,450,000 ML up to EL77 (this flood level was increased as part the 2005 upgrade to allow a water level of EL80m and a temporary flood storage volume of 1,966,000 ML with all fuse plugs initiated and the dam at the point of failure).

The dam has an EXTREME hazard classification under ANCOLD guidelines because of the significant development downstream in the Brisbane and Ipswich metropolitan areas, with the population at risk in the event of a dam failure numbering in the hundreds of thousands.

In accordance with the Queensland Regulatory program for dam spillway upgrades, a further upgrade of Wivenhoe Dam for dam safety reasons only is scheduled to occur prior to 2035 to enable the dam to safely pass the Probable Maximum Flood. This work will involve the reconstruction of Saddle Dam 2 as a fuse plug spillway.

Wivenhoe Dam is in excellent condition. Comprehensive Dam Safety reviews undertaken in accordance with ANCOLD guidelines have been undertaken in 1997 (Gutteridge, Haskins & Davey Pty Ltd), 2003 (Wivenhoe Alliance), 2006 (NSW Department of Commerce), 2009 (GHD) and September 2010 (Seqwater). The reports concluded that the design of the dam is in accordance with modern day standards and that there are no significant outstanding design or construction issues that require investigation.

2 WIVENHOE DAM FLOOD MITIGATION AND FLOOD OPERATIONS

2.1 Flood Mitigation

The Brisbane River catchment covers an area of approximately 14,000 square kilometres of which about half is below Wivenhoe Dam. Maximum overall flood mitigation effect is achieved by operating Wivenhoe Dam in conjunction with Somerset Dam. Although Somerset and Wivenhoe Dam reduce flooding in Brisbane City, major flooding can still occur. The Lockyer-Laidley Valley drains into the Brisbane River through Lockyer Creek that enters the Brisbane River just downstream of Wivenhoe Dam near Lowood. Another major tributary, the Bremer River, flows into the Brisbane River at Moggill. Wivenhoe Dam has no control over inflows into the Brisbane River from both these major tributaries.

Wivenhoe Dam mitigates downstream flooding by storing incoming flood water during a rainfall event and releasing these waters at a reduced flow rate downstream to minimise flood impacts. The timing of the releases is also manipulated so that the aim is for outflows from the dams to impact on downstream areas only after the peak inflows from the downstream major tributaries have passed. However, this aim cannot always be achieved in practice. This is because some large floods, such as the one currently being experienced, have the potential to overflow the dam's flood storage compartment. **Should this occur, the dam would fail and the resulting damage and loss of life would be at least 100 to 1000 times greater than that currently being experienced.**

Therefore the basis of all flood operation decision making is to ensure the dam never fails. This is the reason that the dam's flood storage compartment would never be intentionally fully filled as additional inflows after this point would result in a dam failure. Similarly, there will be uncertainty on future rainfall that could occur which could not be releases if there was insufficient flood storage which could not be stored or released.

Another factor that impacts on flood release decision making in large events are the levels at which the erodible fuse plugs are triggered. Loss of one or more fuse plugs severely limits the ability of the dam to mitigate the effects of future flood events that may occur prior to the fuse plug or plugs being reinstated. Reinstatement of a fuse plug following an event would take a minimum of 4 to 6 months and would require an extended period of relatively dry weather.

2.2 Flood Operations

A real time flood monitoring and forecasting system has been established in the Wivenhoe and Somerset Dam catchments. This system employs radio telemetry to collect, transmit and receive rainfall and stream flow information. The system consists of around 230 field stations that automatically record rainfall and/or river heights at selected locations in the dam catchments. Most of these 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 recorded rainfall in the dam catchments. The RTFM is a suite of hydrologic computer programs that utilise the real time data to assist in the operation of the dams during flood events.

Seqwater engineers use the RTFM for flood monitoring and forecasting during flood events to operate the dams in accordance with a Manual of Flood Mitigation (the origin of and objectives and procedures contained in the Manual of Flood Mitigation are explained in the following section of this document). Releases of water from the dams are optimised to minimise the impacts of flooding in accordance with the objectives and procedures contained in a Manual of Flood Mitigation.

The RTFM and data collection network performed well During the January 2011 event, with no failures experienced that compromised the ability of Seqwater to operate the dam.

3 MANUAL OF FLOOD MITIGATION FOR WIVENHOE AND SOMERSET DAMS

The Manual of Flood Mitigation for Wivenhoe and Somerset Dams, in its current form, was developed in 1992 during an extensive hydrological study of the Brisbane and Pine Rivers catchments by DPI, Water Resources. The final reports were subject to extensive internal review by the Water Resources Group before being reviewed by an independent review panel comprising Professor Colin Apelt, Head of Department, Department of Civil Engineering, University of Queensland and Mr Eric Lesleighter, Principal Hydraulic Engineer and Chief Engineer Water Resources, Snowy Mountains Engineering Corporation.

Subsequently, the Manual was extensively reviewed during the Brisbane Valley Flood Damages Minimisation Study in 2006, with the latest comprehensive review of the Manual undertaken in 2009. Both of these reviews have included expert review panels comprising key stakeholders, with the most recent review involving representatives from DERM, BOM, BCC and SunWater.

The Manual of Flood Mitigation is prepared by Seqwater as the owner of the dam and approved and gazetted by the Chief Executive of DERM in accordance with the Water Supply Act 2008. The manual defines flood objectives procedures; roles and responsibilities; and staffing and operational requirements for flood events impacting on Wivenhoe and Somerset dams.

The primary objectives of the procedures contained in the flood manual are, in order of importance:

- 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);
- 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.

During an event, the operation of the dam transitions between the following four operating strategies depending of the circumstances at the time. These procedures associated with these strategies are explained in detail in the Manual.

- **Strategy W1** – Primary consideration is given to Minimising Disruption to Downstream Rural Life. Under this strategy, the predicted water level is below 68.50 m AHD and the maximum release is 1,900m3/s.

- **Strategy W2** – Transition Phase moving from Minimising Disruption to Protecting Downstream Urban Areas. Under this strategy, the water level is predicted to be between 68.5 and 74.0 m AHD and the maximum release is less than 3,500m3/s.

- **Strategy W3** – Primary consideration is to Protect of Urban Areas from Inundation. Under this strategy, the water level is predicted to be between 68.5 and 74.0 m AHD but the maximum release is less than 4,000m3/s.

- **Strategy W4** – Primary consideration is to protecting the structural safety of the Dam. Under this strategy, the water level is predicted to exceed 74.0 m AHD and there is no limit to the maximum release. Consideration is given to managing flood releases to avoid fuse plug initiation if at all possible as this would compromise flood mitigation capacity in the short to medium term.

In addition to these strategies, 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. Accordingly for each flood event, the aim is always to empty stored floodwaters within seven days after the flood peak has passed through the dams.

4 JANUARY 2011 FLOOD EVENT

4.1 Background

In the 25 days leading up to the current event, three flood events impacting on Wivenhoe Dam were experienced, with gate releases being made on all but five of those days. The total outflow from these events was around 700,000ML. The details of these events are as follows:

EVENT	EVENT START DATE	EVENT END DATE	VOLUME RELEASED (ML)
1	13/12/2010	16/12/2010	70,000
2	17/12/2010	24/12/2010	150,000
3	26/12/2010	02/01/2010	470,000

During these events, requests were received from Councils and residents impacted by bridge closures downstream of the dam to curtail releases as soon and as quickly as possible. Additionally the 2 January end date of the flood event prior to the current event meant that significant drain down of the dam prior to the onset of the current event that commenced on 6 January 2011, was not possible without major bridge inundation downstream of the dam and without exceeding minor flood levels in the lower Brisbane River.

Additionally, a flood event was also experienced in October 2010 that resulted in a release of 750,000ML from the dam. Accordingly drain down below the dam full supply level prior to the start of the first December event would not have been possible without significant bridge inundation and without exceeding minor flood levels (as defined by BOM and BCC) in the lower Brisbane River.

Regardless, significant drain down prior to the current event would have had little impact on the peak level in Wivenhoe Dam as shown in the table below. The reason for this is that this total event inflow volume of 2,600,000 ML is well in excess of the useable flood storage combined with the available water supply storages shown in the table.

The specific impact on the Lower Brisbane River of these reduced dam levels requires the use of a complex hydraulic model. The results of this modelling would still contain a degree of uncertainty as illustrated by the difficulties in estimating the final flood peak in Brisbane during the event. This is because the rapid closure of the gates after peak inflow was achieved resulted in significant water level reductions downstream and this is difficult to model accurately.

JANUARY 2011 FLOOD			
Starting Level		Peak Height	Capacity
%	m AHD	m AHD	%
100	67.0	74.97	191
95	66.5	74.93	191
90	65.8	74.88	190
75	64.0	74.63	187
50	60.0	74.11	180

It should be noted that the possible reductions shown above are based on a dual peaked flood hydrograph with a volume of about 2,600,000 ML which occurred during this event. A hydrograph with the same volume but a different distribution could result in a significantly lower reduction in peak water levels.
Flood operations at the dam are also highly dependent upon the flood inflow volume and a slight variation in the flood volume could significantly reduce the benefits associated with draining down the dam prior to a flood event.

4.2 Event Decision Making

The following table contains a summary of the key decisions points associated with the current event. As at 16 January 2011, the event remains in progress.

DATE AND TIME	FLOOD EVENT MILESTONE
07:00 06/01/2011 (Thursday)	Rainfall is experienced in the dam catchments that will result in flood releases, however Wivenhoe releases are delayed for 24 hours to allow Lockyer Creek flood flows to pass downstream and prevent the isolation of the community dependent of Burtons Bridge. The forecast is for 150mm over the next 24 hours.
15:00 07/01/2011 (Friday)	Wivenhoe releases commence, with operational strategy W1 in use. Rainfall for the next four days is estimated to be between 140mm and 300mm, with a forecast for rain easing on Tuesday 11 January 2011. All bridges downstream of the dam with the exception of Fernvale Bridge and Mt Crosby Weir Bridge are expected to be inundated for a number of days.

06:00 09/01/2011 (Sunday)	Moderate to heavy rain periods forecast until Tuesday, but both Wivenhoe and Somerset dam levels were falling slowly, with Somerset at 1.27 m AHD above FSL and Wivenhoe 1.58 m AHD above FSL.
15:30 09/01/2011 (Sunday)	Following significant rain during the day a meeting of Duty Engineers is held. The QPF issued at 16:00 indicates 50mm to 80mm over the next 24 hours. Based on this forecast, it is anticipated that dam levels can be held to a maximum of 3.50 m AHD above FSL in Somerset and 5.5 m AHD above FSL in Wivenhoe. However, by 19:00 it was apparent that both Fernvale Bridge and Mt Crosby Weir Bridge would be inundated by the combined dam releases and Lockyer Creek flows and that the operational strategy had progressed to W2.
06:30 10/01/2011 (Monday)	Rainfall continued during the night and based on rainfall on the ground it was apparent the operational strategy had progressed to W3.
06:30 10/01/2011 (Monday)	Rainfall continued during the day but based on rainfall on the ground, operational strategy W3 remained in use. However it was apparent that any further heavy rain would result in progression of the operational strategy to W4.
08:00 11/01/2011 (Tuesday)	Rainfall continued during the night with isolated heavy falls in the Wivenhoe Dam catchment area and based on rainfall on the ground it was apparent the operational strategy would soon progress to W4 with Wivenhoe Dam exceeding 8.00 m AHD above FSL. The objective now was to limit outflows and subsequent flood damage to urban areas, while ensuring the structural safety of the dam.
11:00 11/01/2011 (Tuesday)	Rapid inflows were experienced in Wivenhoe Dam, with the dam rising almost a metre in eight hours. Releases were increased until the dam level stabilised in accordance with Strategy W4. Computer models were not reflecting actual dam inflows due to intense point rainfalls in the immediate catchment around the dam. Falls are estimated to be similar to those experienced at both Toowoomba and Upper Lockyer the previous day and are falling outside and between existing rain gauges.
21:00 11/01/2011 (Tuesday)	Wivenhoe Dam peaked. Peak release of 7450 cumecs with a level of 0.7 metres below fuse plug trigger.
22:00 11/01/2011	Wivenhoe Dam releases were closed off as quickly as possible over the

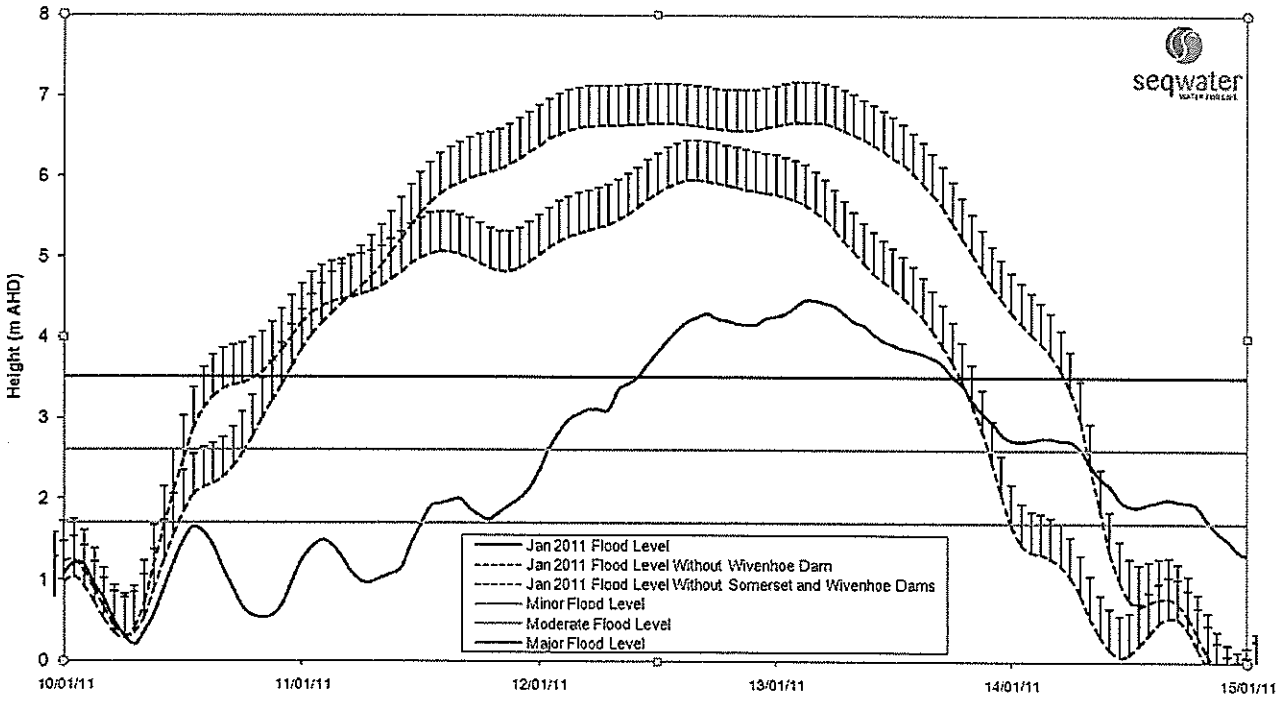
(Tuesday)	next 11 hours, while ensuring water levels in the dam did not rise further and initiate a fuse plug embankment.
08:00 12/01/2011 (Wednesday)	Minimum possible release level reached, with inflows matching outflows. Further reductions in release rate would likely cause the dam level to rise.
21:00 13/01/2011 (Thursday)	The 7 day dam drain down is commenced as Lockyer Creek and Bremer River peaks pass the Lower Brisbane area. Maximum release target is the limit of damaging floods in Brisbane being 3500 cumecs.
09:00 17/01/2011 (Monday)	Drain down continues, with released expected to cease on Wednesday 19 January 2011 unless further rainfall is experienced.

4.3 Flood Mitigation Benefits of Wivenhoe Dam

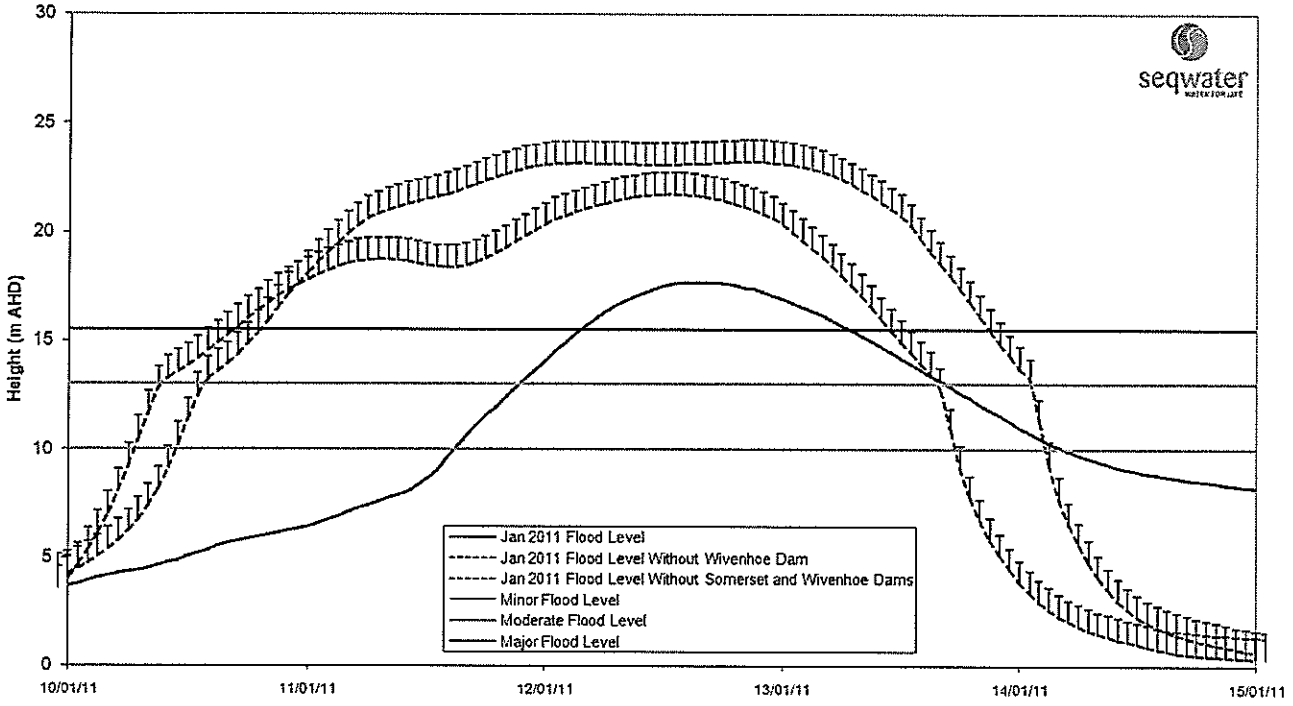
The following graphs demonstrate the significant benefits of Wivenhoe Dam in mitigating the current flood event, with reductions in flood peak of up to 2.5 metres in the City area and up to 5.5 metres in the Moggill area further upstream.

This equates to significant reduction in the potential for loss of life as well as saving in damages in the order of up to $1.6 billion based on current damage curves. Up to 13,000 more properties would have been impacted by the event without the Dam.

The time at which flood levels remained elevated above major levels has also been reduced by up to 3 days by the dam. This has significant benefits to impact on the population of the city, property damage and the recovery operation.



JANUARY 2011 BRISBANE FLOOD
Assessment of Flood Levels at Moggill



The strategy adopted to quickly close off releases once the peak in the dam had been reached and rain stopped falling certainly reduced the predicted flood peak by at least one metre in the lower Brisbane River area. This was carried out because the releases had stopped the dam from rising and careful monitoring allowed rapid reduction of releases while ensuring fuse plug initiation did not occur.

This notion is supported by BOM.

5 EVENT REVIEW

Under the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam that are approved and gazetted by the Department of Environment and Resource Management, there is a regulatory requirement that a report must be prepared as per the below wording:

"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."

Such a report was prepared for the flood events of February and March 2010 and copies are available. A copy of the Table of Contents of that report is included as Appendix 1. For this event, the report would be a comprehensive summary of all procedures, actions, outcomes and processes during the event.

It is recommended that the process and content for reports required for this event be:

- In the short term, utilise this report attached to this briefing note as the basis for communications and discussion.
- Prepare any Interim Reports as agreed to provide information and input as required.
- Seqwater prepare a Comprehensive Report as per the existing regulatory requirements of the Act and the gazetted manual and any requirements of the Dam Safety Regulator. This would be done within 6 weeks of the closure of the current event as per the manual. This timeframe is subject to any new mobilisation of the Flood Operations Centre. The Table of Contents would include:
    - Introduction
    - Flood Event Summary
    - Mobilisation and Staffing
    - Event Rainfall
    - Inflow and Release Details
    - Data Collection System Performance
    - Data Analysis Performance
    - Communication
    - Flood Management Strategies and Manual Compliance
    - Improvements in data collection systems, practices and processes.
    - improvements by interacting agencies

- Review of factors impacting on the protection of urban areas
- Recommendations & Conclusions

- The report would then be reviewed by the Dam Safety Regulator in conjunction with any peer review they require. The review should cover:
  - Were the provisions of the manual complied with?
  - What improvements to either facilities e.g. stream gauges, or work practices, are desirable to improve Sewater's ability to predict inflows into the dams.
  - Are improvements to either Seqwater's facilities or work practices desirable to improve Seqwater's ability to manage events? For example, investigations to raise the dam to improve its flood storage capacity, If so, what are they and their implications.
  - Are changes to the facilities or work practices of other organisations desirable to improve Seqwater's abilities to manage these events?
  - whether it is worth investigating increasing the flood capacity of Wivenhoe
  - whether the Brisbane River crossings which act, under some situations as a constraint on the releases from Wivenhoe, should be replaced by bridges. For example if the smallest could pass , for example, 2,500 cumecs, then this could enable higher releases under some circumstances.
  - Whether the policy of draining the flood compartment within 7 days should be modified.
  - Given the manual's order of priorities i.e. protection of the dam etc, are any changes in the flood release strategies for either dam desirable? If so, what are they, and their implications
- Based on this review, a review of the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam would occur utilising an expert panel of review including representatives of DERM, Seqwater, BoM, affected Local Governments and other stakeholders as necessary.

Appendix A

FINAL REPORT – FLOOD EVENTS AT WIVENHOE, SOMERSET AND NORTH PINE DAMS FOR FEBRUARY AND MARCH 2010

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Ministerial Briefing Note

17 January 2010

Flood Event January 2011

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2.1 What were the benefits provided by Wivenhoe Dam during the current event?

2.2 Why was Wivenhoe Dam only allowed to rise up to 191% and not 230%?

2.3 What is the role of the erodible fuse plug embankments?

2.4 Why weren't pre-emptive releases undertaken prior to the start of the flood event?

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3. THE MANUAL OF OPERATIONAL PROCEDURES FOR FLOOD MITIGATION AT WIVENHOE DAM AND SOMERSET DAM

3.1 What is the Manual of Flood Mitigation and how was it developed?

3.2 What is contained in the Manual?

4. REGULATORY CONTEXT

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1 BACKGROUND INFORMATION ON WIVENHOE DAM

Wivenhoe Dam was completed in 1984 and has two main functions;

- A 1,165,000 ML storage providing an urban water supply for Brisbane;
- Flood mitigation in the Brisbane River by providing a dedicated flood storage volume of 1,450,000 ML (this flood storage was increased in 2005 to 1,966,000 ML with the dam at the point of failure).

In accordance with the Queensland Regulatory program for dam spillway upgrades, a further upgrade of Wivenhoe Dam is scheduled to occur prior to 2035. Would it have made any difference to the current flood event?

Was it relevant to this event i.e any di? Would water have been released through it? Would the Flood Mitigation Manual decision levels changed?
Such an upgrade is only for dam security for PMF not flood mitigation. Changed some wording to reflect this.

Wivenhoe Dam is in excellent condition with four Comprehensive Dam Safety reviews undertaken in the last 14 years, the latest in 2010.

2 WIVENHOE DAM FLOOD MITIGATION AND FLOOD OPERATIONS

2.1 What were the benefits provided by Wivenhoe Dam during the current event?

The following graphs demonstrate the significant benefits of Wivenhoe Dam in mitigating the current flood event, with reductions in flood peak of up to 2.5 metres in the City area and up to 5.5 metres in the Moggill area further upstream.

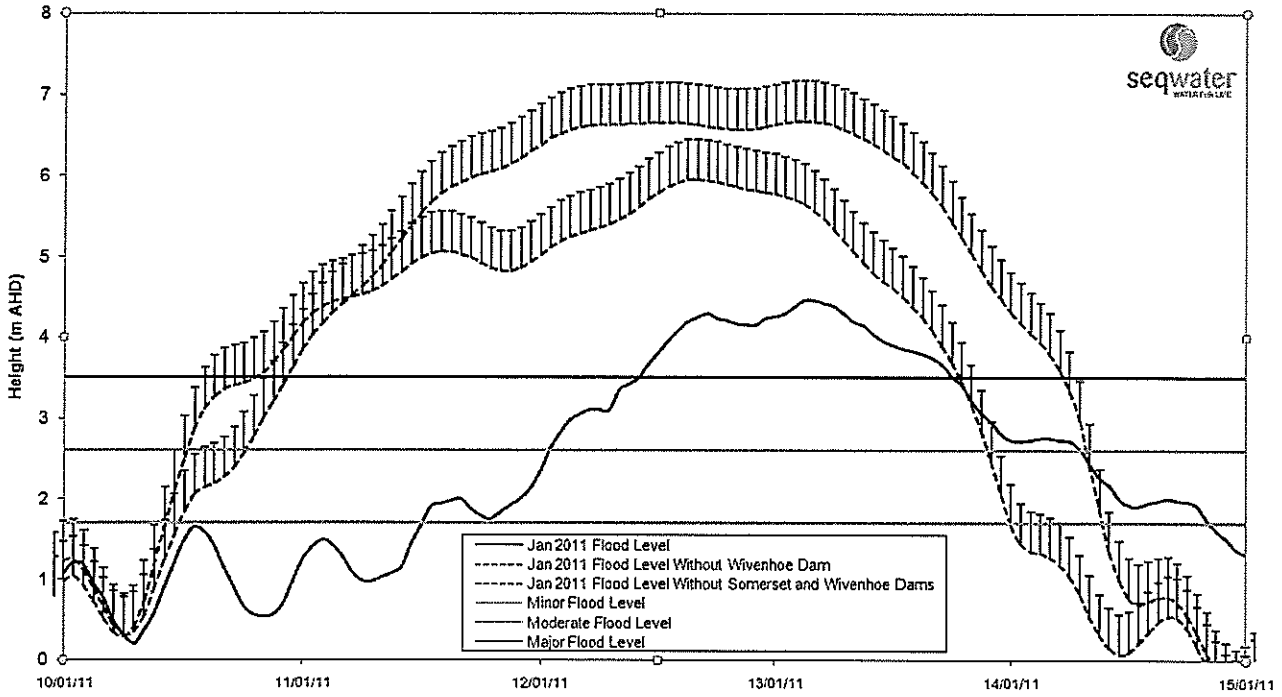
This equates to significant reduction in the potential for loss of life as well as saving in damages in the order of up to $1.6 billion based on current damage curves. Up to 13,000 more properties would have been impacted by the event without the Dam. (Source: Flood Damage Tables provided to Seqwater by the Brisbane City Council).

The time at which flood levels remained elevated above major levels has also been reduced by up to 3 days by the dam. This has significant benefits to impact on the population of the city, property damage and the recovery operation.

Depending on the nature of the event, the presence of Wivenhoe Dam could also potentially increase flood warning times to impacted areas. How these times may have been increased during the current event is presently difficult to quantify, but discussions will be held with BOM on this issue at a later date.

In addition, the strategy adopted to quickly close off releases once the peak in the dam had been reached and rain stopped falling certainly reduced the predicted flood peak by at least one metre in the lower Brisbane River area.

JANUARY 2011 BRISBANE FLOOD
Assessment of Flood Levels at Brisbane City



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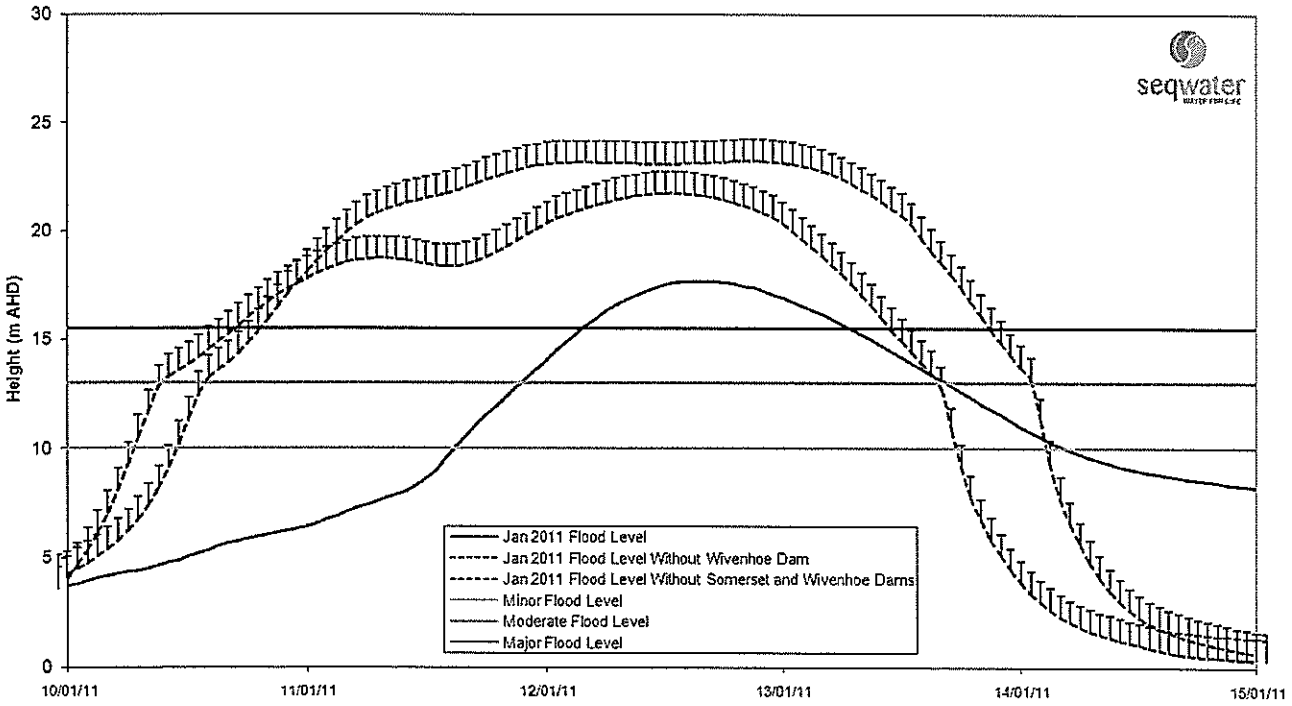

Blue line of graph – Breakdown the component of % of Wivenhoe Dam release and downstream inflows. **Seqwater will undertake this work with the BoM but will take some time.**

2.2 Why was Wivenhoe Dam only allowed to rise up to 191% and not 230%?

Wivenhoe Dam mitigates downstream flooding by storing incoming flood water during a rainfall event and releasing these waters at a reduced flow rate downstream to reduce flood impacts. The timing of the releases is also manipulated so that the aim is for outflows from the dams to impact on downstream areas only after the peak inflows from the downstream major tributaries have passed. However this aim cannot always be achieved in practice. This is because some large floods, such as the one currently being experienced, have the potential to overflow the dam's flood storage compartment. **Should this occur, the dam would fail and the resulting damage and loss of life would be at least 100 to 1000 times greater than that currently being experienced.**

Therefore the basis of all flood operation decision making is to ensure the dam never fails. This is the reason that the dam's flood storage compartment would never be intentionally fully filled as any additional inflows after this point would result in a dam failure. At any one time, there will always be uncertainty about what rain is going to occur. Hence, we cannot use all of the flood capacity as we would not be able to release sufficient water to cater for large inflows.

Why didn't we let the first fuse plug go? Why not 200%? Why not 205%? Dam is rock core etc. See below reasons for not allowing fuse plugs to go.

2.3 What is the role of the erodible fuse plug embankments?

Another factor that impacts on flood release decision making in large events are the levels at which the erodible fuse plugs are triggered. The fuse plugs act as a safety valve to rapidly increase dam outflows if the structural safety of the dam is in danger. Loss of one or more fuse plugs severely limits the ability of the dam to mitigate the effects of future flood events that may occur prior to the fuse plug or plugs being reinstated. Reinstatement of a fuse plug following an event would take a minimum of 4 to 6 months and would require an extended period of relatively dry weather.

2.4 Why weren't pre-emptive releases undertaken prior to the start of the flood event?

In the 25 days leading up to the current event, three flood events impacting on Wivenhoe Dam were experienced, with gate releases being made on all but five of those days. The total outflow from these events was around 700,000ML.

Detail specific impacts – which bridges knocked out, how long people isolated, which towns impacted, how many people impacted?This will take quite some time to collate even in terms of times bridges are out, we are still in the middle of a release. Numbers of people will come from council but these details cannot be collated at the moment. Will attempt to do in the next week or so during meetings planned with Councils over the next few weeks.

During these events, requests were received from Councils and residents impacted by bridge closures downstream of the dam to curtail releases as soon and as quickly as possible. Additionally the 2 January end date of the flood event prior to the current event meant that significant drain down of the dam prior to the onset of the current event that commenced on 6 January 2011, was not possible without major bridge inundation downstream of the dam and without exceeding minor flood levels in the lower Brisbane River.

Additionally, a flood event was also experienced in October 2010 that resulted in a release of 750,000ML from the dam. Accordingly drain down below the dam full supply level prior to the start of the first December event would not have been possible without significant bridge inundation and without exceeding minor flood levels (as defined by BOM and BCC) in the lower Brisbane River.

Regardless, significant drain down prior to the current event would have had little impact on the peak level in Wivenhoe Dam as shown in the table below. The reason for this is that this total event inflow volume of 2,600,000 ML is well in excess of the useable flood storage combined with the available water supply storages shown in the table.

The specific impact on the Lower Brisbane River of these reduced dam levels requires the use of a complex hydraulic model. The results of this modelling would still contain a degree of uncertainty as illustrated by the difficulties in estimating the final flood peak in Brisbane during the event. This is because the rapid closure of the gates after peak inflow was

achieved resulted in significant water level reductions downstream and this is difficult to model accurately.

What are the assumptions in terms of the releases at different levels?Don't fully understand, can address at a leter date.

JANUARY 2011 FLOOD			
Starting Level		Peak Height	Capacity
%	m AHD	m AHD	%
100	67.0	74.97	191
95	66.5	74.93	191
90	65.8	74.88	190
75	64.0	74.63	187
50	60.0	74.11	180

It should be noted that the possible reductions shown above are based up a unique dual peaked flood hydrograph with a volume of about 2,600,000 ML which occurred during this event. A hydrograph with the same volume but a different distribution could result in a significantly lower reduction in peak water levels.
Flood operations at the dam are also highly dependent upon the flood inflow volume and a slight variation in the flood volume could significantly reduce the benefits associated with draining down the dam prior to a flood event.

2.5 Is there a detailed record of the events associated with the current flood?

A preliminary report has been prepared and is attached to this briefing.

3 THE MANUAL OF FLOOD MITIGATION AT WIVENHOE DAM AND SOMERSET DAM

3.1 What is the Manual of Flood Mitigation and how was it developed?

The Manual of Flood Mitigation for Wivenhoe and Somerset dams in its current form was developed in 1992 during an extensive hydrological study of the Brisbane and Pine Rivers catchments by DPI, Water Resources. The final reports were subject to extensive internal review by the Water Resources Group before being reviewed by an independent review panel comprising Professor Colin Apelt, Head of Department, Department of Civil Engineering, University of Queensland and Mr Eric Lesleighter, Principal Hydraulic Engineer and Chief Engineer Water Resources, Snowy Mountains Engineering Corporation. Subsequently, the Manual was extensively reviewed during the Brisbane Valley Flood Damages Minimisation Study in 2006, with the latest comprehensive review of the Manual undertaken in 2009. Both of these reviews have included expert review panels comprising key stakeholders, with the most recent review involving representatives from DERM, BOM, BCC and SunWater.

Can we attach CV of experts? Note Colin Apelt chaired the Brisbane Flood Study and chairs the current Brisbane Flood taskforce.Not available at the moment and would not be the CV when he was involved in 1992.

The Manual of Flood Mitigation is prepared by Seqwater as the owner of the dam and approved and gazetted by the Chief Executive of DERM in accordance with the Water Supply Act 2008. The manual defines flood objectives procedures; roles and responsibilities; and staffing and operational requirements for flood events impacting on Wivenhoe and Somerset dams.

3.2 What is contained in the Manual?

The primary objectives of the procedures contained in the Manual are, in order of importance:

- 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);
- 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.

During an event, the operation of the dam transitions between the following four operating strategies depending of the circumstances at the time. These procedures associated with these strategies are explained in detail in the Manual.

- **Strategy W1** – Primary consideration is given to Minimising Disruption to Downstream Rural Life.
- **Strategy W2** – Transition Phase moving from Minimising Disruption to Protecting Downstream Urban Areas.
- **Strategy W3** – Primary consideration is to Protect of Urban Areas from Inundation.
- **Strategy W4** – Primary consideration is to protecting the structural safety of the Dam.

In addition to these strategies, 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. Accordingly for each flood event, the aim is always to empty stored floodwaters within seven days after the flood peak has passed through the dams.

4 REGULATORY CONTEXT (Provided by Peter Allen and unedited)

These are contained in the Flood Mitigation Manual (manual) approved under sections 370 to 374 of the *Water Supply (Safety and Reliability) Act 2008.* The Chief Executive Officer (CEO) of DERM (or his delegate) approves the manual, and the approval is notified in the Queensland Government Gazette. Approval can be for a period of up to five years, after which the approval needs to be renewed. There are no decision-making criteria specified in the Act for the CEO to take into account when approving the manual.

The manual for the dams requires, amongst other matters:

1. Flood operations to be conducted in accordance with manual's provisions. (There is an approval process specified in the manual, if Seqwater considers a different flood release strategy is desirable to deal with a particular flood event. This was not used in the January 2011 flood event)
2. Flood operations to be under the control of CEO-approved engineers (who are highly qualified and experienced)
3. Annual reporting on the preparedness and status of the flood control system for flood operations, and the training of the personnel who manage the flood events.
4. Reporting on the flood operations during flood events.
5. Reviews after flood events such as the January 2011 event. For this flood event, the Queensland Government engaged Mr Brian Cooper, an independent consulting engineer, to review compliance with the manual. Mr Cooper concluded (Attachment??): "...The strategies in the Flood Mitigation Manual have been followed, allowing for the discretion given to make variations in order to maximise flood mitigation effects. The actions taken and decisions made during the Flood Event appear to have been prudent and appropriate in the context of the available knowledge available to these responsible for flood operations and the way events unfolded..." (p.3 of the final report or other appropriate reference??)

See Peter Allen

The manual is separate from a draft communication protocol (Insert name) between the Local, State and Commonwealth government agencies that are affected by the dams' flood operations. This protocol is not binding on the parties to it is not subject to regulatory approval/review.

Some DERM staff, because of their specialist skills, work in the Flood Operations Centre that Seqwater activates to manage such events. None of them are involved in any of the regulatory decisions concerning the dams or are members of the work unit (Office of the Water Supply Regulator) which undertakes the CEO's regulatory functions.

5 COMPLIANCE WITH THE MANUAL

(To be provided)

6 SEQWATER REPORT

It is recommended that the process and content for reports required for this event be:

- In the short term, utilise this report attached to this briefing note as the basis for communications and discussion.
- Prepare any Interim Reports as agreed to provide information and input as required.
- Seqwater prepare a Comprehensive Report as per the existing regulatory requirements of the Act and the gazetted manual and any requirements of the Dam Safety Regulator. This would be done within 6 weeks of the closure of the current event as per the manual. This timeframe is subject to any new mobilisation of the Flood Operations Centre. The Table of Contents would include:
    - Introduction
    - Flood Event Summary
    - Mobilisation and Staffing
    - Event Rainfall
    - Inflow and Release Details
    - Data Collection System Performance
    - Data Analysis Performance
    - Communication
    - Flood Management Strategies and Manual Compliance
    - Improvements in data collection systems, practices and processes.
    - improvements by interacting agencies
    - Review of factors impacting on the protection of urban areas
    - Recommendations & Conclusions
- The report would then be reviewed by the Dam Safety Regulator in conjunction with any peer review they require. The review should cover:
    - Were the provisions of the manual complied with?
    - What improvements to either facilities e.g. stream gauges, or work practices, are desirable to improve Sewater's ability to predict inflows into the dams.
    - Are improvements to either Seqwater's facilities or work practices desirable to improve Seqwater's ability to manage events? For example, investigations to raise the dam to improve its flood storage capacity, If so, what are they and their implications

- Are changes to the facilities or work practices of other organisations desirable to improve Seqwater's abilities to manage these events? If so, what are they and their implications? (For example, would it be worth funding Brisbane River crossing upgrades so that floodwater could be released faster, while not adversely affecting access to properties--or maybe alternative strategies e.g. resupply operations could be put in place to achieve similar outcomes?)
- Given the manual's order of priorities i.e. protection of the dam etc, are any changes in the flood release strategies for either dam desirable? If so, what are they, and their implications

- Based on this review, a review of the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam would occur utilising an expert panel of review including representatives of DERM, Seqwater, BoM, affected Local Governments and other stakeholders as necessary.

seqwater

WATER FOR LIFE

JANUARY 2011 FLOOD EVENT

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1 INTRODUCTION

Wivenhoe Dam was constructed by the Queensland Government between 1977 and 1984. The dam is a 56 m AHD high and 2.3 kilometre long earth and rock embankment separated into two parts by a concrete gravity spillway. The spillway is controlled by 5 radial gates, each 12.0 metres wide by 16.0 m AHD high. Two saddle dam embankments are located on the left side of the reservoir.

The dam spillway capacity was upgraded in 2005. This was done primarily through the construction of a 164 metre wide secondary spillway through the right abutment of the existing dam. This spillway contains three erodible earth fill fuse plug embankments that are initiated at different dam levels in excess of EL 75.6.

The dam has two main functions by providing:

- A 1,165,000 ML storage at full supply level (FSL EL 67.0) providing an urban water supply for Brisbane and surrounding areas;

- Flood mitigation in the Brisbane River by providing a dedicated flood storage volume of 1,450,000 ML up to EL77 (this flood level was increased as part the 2005 upgrade to allow a water level of EL80m and a temporary flood storage volume of 1,966,000 ML with all fuse plugs initiated and the dam at the point of failure).

The dam has an EXTREME hazard classification under ANCOLD guidelines because of the significant development downstream in the Brisbane and Ipswich metropolitan areas, with the population at risk in the event of a dam failure numbering in the hundreds of thousands.

In accordance with the Queensland Regulatory program for dam spillway upgrades, a further upgrade of Wivenhoe Dam is scheduled to occur prior to 2035 to enable the dam to safely pass the Probable Maximum Flood. This work will involve the reconstruction of Saddle Dam 2 as a fuse plug spillway.

Wivenhoe Dam is in excellent condition. Comprehensive Dam Safety reviews undertaken in accordance with ANCOLD guidelines have been undertaken in 1997 (Gutteridge, Haskins & Davey Pty Ltd), 2003 (Wivenhoe Alliance), 2006 (NSW Department of Commerce), 2009 (GHD) and September 2010 (Seqwater). The reports concluded that the design of the dam is in accordance with modern day standards and that there are no significant outstanding design or construction issues that require investigation.

2 WIVENHOE DAM FLOOD MITIGATION AND FLOOD OPERATIONS

2.1 Flood Mitigation

The Brisbane River catchment covers an area of approximately 14,000 square kilometres of which about half is below Wivenhoe Dam. Maximum overall flood mitigation effect is achieved by operating Wivenhoe Dam in conjunction with Somerset Dam. Although Somerset and Wivenhoe Dam reduce flooding in Brisbane City, major flooding can still occur. The Lockyer-Laidley Valley drains into the Brisbane River through Lockyer Creek that enters the Brisbane River just downstream of Wivenhoe Dam near Lowood. Another major tributary, the Bremer River, flows into the Brisbane River at Moggill. Wivenhoe Dam has no control over inflows into the Brisbane River from both these major tributaries.

Wivenhoe Dam mitigates downstream flooding by storing incoming flood water during a rainfall event and releasing these waters at a reduced flow rate downstream to minimise flood impacts. The timing of the releases is also manipulated so that the aim is for outflows from the dams to impact on downstream areas only after the peak inflows from the downstream major tributaries have passed. However, this aim cannot always be achieved in practice. This is because some large floods, such as the one currently being experienced, have the potential to overflow the dam's flood storage compartment. **Should this occur, the dam would fail and the resulting damage and loss of life would be at least 100 to 1000 times greater than that currently being experienced.**

Therefore the basis of all flood operation decision making is to ensure the dam never fails. This is the reason that the dam's flood storage compartment would never be intentionally fully filled as additional inflows after this point would result in a dam failure. Similarly, there will be uncertainty on future rainfall that could occur which could not be releases if there was insufficient flood storage which could not be stored or released.

Another factor that impacts on flood release decision making in large events are the levels at which the erodible fuse plugs are triggered. Loss of one or more fuse plugs severely limits the ability of the dam to mitigate the effects of future flood events that may occur prior to the fuse plug or plugs being reinstated. Reinstatement of a fuse plug following an event would take a minimum of 4 to 6 months and would require an extended period of relatively dry weather.

2.2 Flood Operations

A real time flood monitoring and forecasting system has been established in the Wivenhoe and Somerset Dam catchments. This system employs radio telemetry to collect, transmit and receive rainfall and stream flow information. The system consists of around 230 field stations that automatically record rainfall and/or river heights at selected locations in the dam catchments. Most of these 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 recorded rainfall in the dam catchments. The RTFM is a suite of hydrologic computer programs that utilise the real time data to assist in the operation of the dams during flood events.

Seqwater engineers use the RTFM for flood monitoring and forecasting during flood events to operate the dams in accordance with a Manual of Flood Mitigation (the origin of and objectives and procedures contained in the Manual of Flood Mitigation are explained in the following section of this document). Releases of water from the dams are optimised to minimise the impacts of flooding in accordance with the objectives and procedures contained in a Manual of Flood Mitigation.

The RTFM and data collection network performed well During the January 2011 event, with no failures experienced that compromised the ability of Seqwater to operate the dam.
Inconsistent with statement on page 8?No, in general the system worked well, the fact that a high intensity event could happen where we do not have stations can occur regardless of how many you have, it could happen over the lake and the only way to really monitor is lake rise.

3 MANUAL OF FLOOD MITIGATION FOR WIVENHOE AND SOMERSET DAMS

The Manual of Flood Mitigation for Wivenhoe and Somerset Dams, in its current form, was developed in 1992 during an extensive hydrological study of the Brisbane and Pine Rivers catchments by DPI, Water Resources. The final reports were subject to extensive internal review by the Water Resources Group before being reviewed by an independent review panel comprising Professor Colin Apelt, Head of Department, Department of Civil Engineering, University of Queensland and Mr Eric Lesleighter, Principal Hydraulic Engineer and Chief Engineer Water Resources, Snowy Mountains Engineering Corporation.

Subsequently, the Manual was extensively reviewed during the Brisbane Valley Flood Damages Minimisation Study in 2006, with the latest comprehensive review of the Manual undertaken in 2009. Both of these reviews have included expert review panels comprising key stakeholders, with the most recent review involving representatives from DERM, BOM, BCC and SunWater.

The Manual of Flood Mitigation is prepared by Seqwater as the owner of the dam and approved and gazetted by the Chief Executive of DERM in accordance with the Water Supply Act 2008. The manual defines flood objectives procedures; roles and responsibilities; and staffing and operational requirements for flood events impacting on Wivenhoe and Somerset dams.

The primary objectives of the procedures contained in the flood manual are, in order of importance:

- 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);
- 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.

During an event, the operation of the dam transitions between the following four operating strategies depending of the circumstances at the time. These procedures associated with these strategies are explained in detail in the Manual.

- **Strategy W1** – Primary consideration is given to Minimising Disruption to Downstream Rural Life. Under this strategy, the predicted water level is below 68.50 m AHD and the maximum release is 1,900m3/s.

- **Strategy W2** – Transition Phase moving from Minimising Disruption to Protecting Downstream Urban Areas. Under this strategy, the water level is predicted to be between 68.5 and 74.0 m AHD and the maximum release is less than 3,500m3/s. River flows at Moggill? Not releases? True, but we have just inserted straight from the manual rather than add too much detail, but it is true that there is a relationship to Moggill.

- **Strategy W3** – Primary consideration is to Protect of Urban Areas from Inundation. Under this strategy, the water level is predicted to be between 68.5 and 74.0 m AHD but the maximum release is less than 4,000m3/s. River flows at Moggill? Not releases? True, but we have just inserted straight from the manual rather than add too much detail, but it is true that there is a relationship to Moggill.

- **Strategy W4** – Primary consideration is to protecting the structural safety of the Dam. Under this strategy, the water level is predicted to exceed 74.0 m AHD and there is no limit to the maximum release. Consideration is given to managing flood releases to avoid fuse plug initiation if at all possible as this would compromise flood mitigation capacity in the short to medium term.

In addition to these strategies, 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. Accordingly for each flood event, the aim is always to empty stored floodwaters within seven days after the flood peak has passed through the dams.

4 JANUARY 2011 FLOOD EVENT

4.1 Background

In the 25 days leading up to the current event, three flood events impacting on Wivenhoe Dam were experienced, with gate releases being made on all but five of those days. The total outflow from these events was around 700,000ML. The details of these events are as follows:

EVENT	EVENT START DATE	EVENT END DATE	VOLUME RELEASED (ML)
1	13/12/2010	16/12/2010	70,000
2	17/12/2010	24/12/2010	150,000 Should this be 370,000 as per teleconference?
3	26/12/2010	02/01/2010	470,000

Leave as 150,000 as we believe this is correct, will confirm if 350,000 was based on some other numbers.

During these events, requests were received from Councils and residents impacted by bridge closures downstream of the dam to curtail releases as soon and as quickly as possible. Additionally the 2 January end date of the flood event prior to the current event meant that significant drain down of the dam prior to the onset of the current event that commenced on 6 January 2011, was not possible without major bridge inundation downstream of the dam and without exceeding minor flood levels in the lower Brisbane River.

Additionally, a flood event was also experienced in October 2010 that resulted in a release of 750,000ML from the dam. Accordingly drain down below the dam full supply level prior to the start of the first December event would not have been possible without significant bridge inundation and without exceeding minor flood levels (as defined by BOM and BCC) in the lower Brisbane River.

Regardless, significant drain down prior to the current event would have had little impact on the peak level in Wivenhoe Dam as shown in the table below. The reason for this is that this total event inflow volume of 2,600,000 ML is well in excess of the useable flood storage combined with the available water supply storages shown in the table.

The specific impact on the Lower Brisbane River of these reduced dam levels requires the use of a complex hydraulic model. The results of this modelling would still contain a degree of uncertainty as illustrated by the difficulties in estimating the final flood peak in Brisbane during the event. This

is because the rapid closure of the gates after peak inflow was achieved resulted in significant water level reductions downstream and this is difficult to model accurately.

JANUARY 2011 FLOOD			
Starting Level		Peak Height	Capacity
%	m AHD	m AHD	%
100	67.0	74.97	191
95	66.5	74.93	191
90	65.8	74.88	190
75	64.0	74.63	187
50	60.0	74.11	180

It should be noted that the possible reductions shown above are based up a unique dual peaked flood hydrograph with a volume of about 2,600,000 ML which occurred during this event. A hydrograph with the same volume but a different distribution could result in a significantly lower reduction in peak water levels.
Flood operations at the dam are also highly dependent upon the flood inflow volume and a slight variation in the flood volume could significantly reduce the benefits associated with draining down the dam prior to a flood event.

Assumptions for model?The model was developed by the Expert Panel as part of the Manual review in 2009, we did not include this in the report as we should check with the panel first.

Is it a dual or triple peak? Should we explain in detail why is it so unique?It is a dual peak, we have removed unique as all are unique.

4.2 Event Decision Making

The following table contains a summary of the key decisions points associated with the current event. As at 16 January 2011, the event remains in progress.

Weather forecasts were consistently less than actual. Emphasise reliance on BOM advice. Need to specify BOM forecasts and actual rainfall experienced for each time step.

We will need to do significant investigation into this and discussions with the BoM before we make any claims regarding forecast accuracy. The BoM issues a variety of forecasts both qualitative and quantitative.

DATE AND TIME	FLOOD EVENT MILESTONE
07:00 06/01/2011 (Thursday)	Rainfall is experienced in the dam catchments that will result in flood releases, however Wivenhoe releases are delayed for 24 hours to allow Lockyer Creek flood flows to pass downstream and prevent the isolation of the community dependent of Burtons Bridge. The forecast is for 150mm

	over the next 24 hours.
15:00 07/01/2011 (Friday)	Wivenhoe releases commence, with operational strategy W1 in use. Rainfall for the next four days is estimated to be between 140mm and 300mm, with a forecast for rain easing on Tuesday 11 January 2011. All bridges downstream of the dam with the exception of Fernvale Bridge and Mt Crosby Weir Bridge are expected to be inundated for a number of days.

06:00 09/01/2011 (Sunday)	Moderate to heavy rain periods forecast until Tuesday, but both Wivenhoe and Somerset dam levels were falling slowly, with Somerset at 1.27 m AHD above FSL and Wivenhoe 1.58 m AHD above FSL.
15:30 09/01/2011 (Sunday)	Following significant rain during the day a meeting of Duty Engineers is held. The QPF issued at 16:00 indicates 50mm to 80mm over the next 24 hours. Based on this forecast, it is anticipated that dam levels can be held to a maximum of 3.50 m AHD above FSL in Somerset and 5.5 m AHD above FSL in Wivenhoe. However, by 19:00 it was apparent that both Fernvale Bridge and Mt Crosby Weir Bridge would be inundated by the combined dam releases and Lockyer Creek flows and that the operational strategy had progressed to W2.
06:30 10/01/2011 (Monday)	Rainfall continued during the night and based on rainfall on the ground it was apparent the operational strategy had progressed to W3.
06:30 10/01/2011 (Monday)	Rainfall continued during the day but based on rainfall on the ground, operational strategy W3 remained in use. However it was apparent that any further heavy rain would result in progression of the operational strategy to W4.
08:00 11/01/2011 (Tuesday)	Rainfall continued during the night with isolated heavy falls in the Wivenhoe Dam catchment area and based on rainfall on the ground it was apparent the operational strategy would soon progress to W4 with Wivenhoe Dam exceeding 8.00 m AHD above FSL. The objective now was to limit outflows and subsequent flood damage to urban areas, while ensuring the structural safety of the dam.
11:00 11/01/2011 (Tuesday)	Rapid inflows were experienced in Wivenhoe Dam, with the dam rising almost a metre in eight hours. Releases were increased until the dam level stabilised in accordance with Strategy W4. Computer models were not reflecting actual dam inflows due to intense point rainfalls in the immediate catchment around the dam. Falls are estimated to be similar to those experienced at both Toowoomba and Upper Lockyer the previous day and are falling outside and between existing rain gauges.
21:00 11/01/2011 (Tuesday)	Wivenhoe Dam peaked. Peak release of 7450 cumecs with a level of 0.7 metres below fuse plug trigger.
22:00 11/01/2011	Wivenhoe Dam releases were closed off as quickly as possible over the

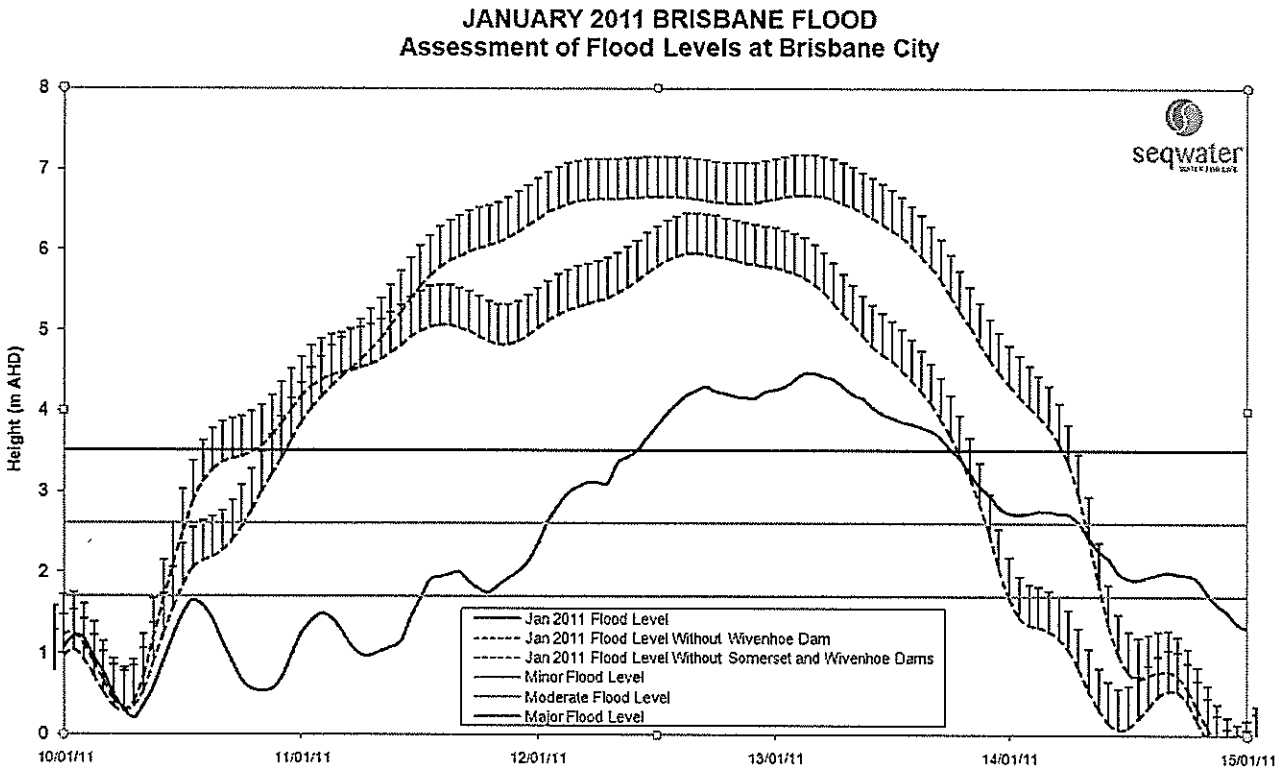
(Tuesday)	next 11 hours, while ensuring water levels in the dam did not rise further and initiate a fuse plug embankment.
08:00 12/01/2011 (Wednesday)	Minimum possible release level reached, with inflows matching outflows. Further reductions in release rate would likely cause the dam level to rise.
21:00 13/01/2011 (Thursday)	The 7 day dam drain down is commenced as Lockyer Creek and Bremer River peaks pass the Lower Brisbane area. Maximum release target is the limit of damaging floods in Brisbane being 3500 cumecs.
09:00 17/01/2011 (Monday)	Drain down continues, with released expected to cease on Wednesday 19 January 2011 unless further rainfall is experienced.

4.3 Flood Mitigation Benefits of Wivenhoe Dam

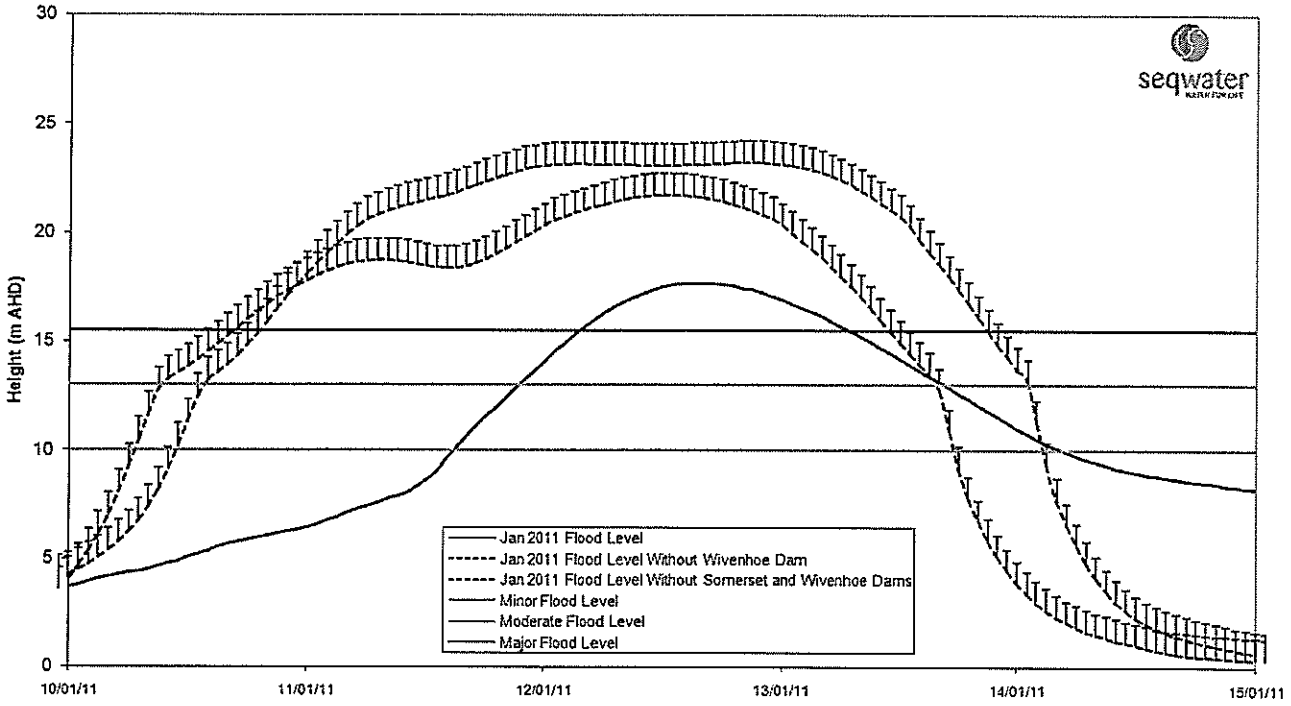
The following graphs demonstrate the significant benefits of Wivenhoe Dam in mitigating the current flood event, with reductions in flood peak of up to 2.5 metres in the City area and up to 5.5 metres in the Moggill area further upstream.

This equates to significant reduction in the potential for loss of life as well as saving in damages in the order of up to $1.6 billion based on current damage curves. Up to 13,000 more properties would have been impacted by the event without the Dam.

The time at which flood levels remained elevated above major levels has also been reduced by up to 3 days by the dam. This has significant benefits to impact on the population of the city, property damage and the recovery operation.



JANUARY 2011 BRISBANE FLOOD
Assessment of Flood Levels at Moggill



The strategy adopted to quickly close off releases once the peak in the dam had been reached and rain stopped falling certainly reduced the predicted flood peak by at least one metre in the lower Brisbane River area. This notion is supported by BOM.

Blue line of graph – Breakdown the component of % of Wivenhoe Dam release and downstream inflows. **As per briefing note comment.**

5 EVENT REVIEW

Under the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam that are approved and gazetted by the Department of Environment and Resource Management, there is a regulatory requirement that a report must be prepared as per the below wording:

"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."

Such a report was prepared for the flood events of February and March 2010 and copies are available. A copy of the Table of Contents of that report is included as Appendix 1. For this event, the report would be a comprehensive summary of all procedures, actions, outcomes and processes during the event.

It is recommended that the process and content for reports required for this event be:

- In the short term, utilise this report attached to this briefing note as the basis for communications and discussion.
- Prepare any Interim Reports as agreed to provide information and input as required.
- Seqwater prepare a Comprehensive Report as per the existing regulatory requirements of the Act and the gazetted manual and any requirements of the Dam Safety Regulator. This would be done within 6 weeks of the closure of the current event as per the manual. This timeframe is subject to any new mobilisation of the Flood Operations Centre. The Table of Contents would include:
    - Introduction
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    - Data Collection System Performance
    - Data Analysis Performance
    - Communication
    - Flood Management Strategies and Manual Compliance
    - Improvements in data collection systems, practices and processes.
    - improvements by interacting agencies

- Review of factors impacting on the protection of urban areas
- Recommendations & Conclusions

- The report would then be reviewed by the Dam Safety Regulator in conjunction with any peer review they require. The review should cover:
  - Were the provisions of the manual complied with?
  - What improvements to either facilities e.g. stream gauges, or work practices, are desirable to improve Sewater's ability to predict inflows into the dams.
  - Are improvements to either Seqwater's facilities or work practices desirable to improve Seqwater's ability to manage events? For example, investigations to raise the dam to improve its flood storage capacity, If so, what are they and their implications.
  - Are changes to the facilities or work practices of other organisations desirable to improve Seqwater's abilities to manage these events? If so, what are they and their implications? (For example, would it be worth funding Brisbane River crossing upgrades so that floodwater could be released faster, while not adversely affecting access to properties--or maybe alternative strategies e.g. resupply operations could be put in place to achieve similar outcomes?)
  - Given the manual's order of priorities i.e. protection of the dam etc, are any changes in the flood release strategies for either dam desirable? If so, what are they, and their implications
- Based on this review, a review of the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam would occur utilising an expert panel of review including representatives of DERM, Seqwater, BoM, affected Local Governments and other stakeholders as necessary.

Appendix A

FINAL REPORT – FLOOD EVENTS AT WIVENHOE, SOMERSET AND NORTH PINE DAMS FOR FEBRUARY AND MARCH 2010

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Suzie Emery

From: Bradley John [John.Bradley[redacted]
Sent: Sunday, 16 January 2011 9:57 PM
To: Dan Spiller
Subject: RE: Talking points_Wivenhoe Dam releases

Follow Up Flag: Follow up
Flag Status: Flagged

Thanks Dan - this is generally clear - suggest make the preface to the ANCOLD standard answer clearer, so the TPs relfect what the difference from the standard was

thanks
John B

From: Dan Spiller [mailto:Daniel.Spiller[redacted]
Sent: Sunday, 16 January 2011 9:26 PM
To: Bradley John
Subject: Talking points_Wivenhoe Dam releases

For review in case you are still at it.

Dan

Suzie Emery

From: Bradley John [John.Bradley[redacted]]
Sent: Sunday, 16 January 2011 9:57 PM
To: Dan Spiller
Subject: RE: Talking points_Wivenhoe Dam releases

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Sent: Sunday, 16 January 2011 9:26 PM
To: Bradley John
Subject: Talking points_Wivenhoe Dam releases

For review in case you are still at it.

Dan

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

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

+------------------------------------------------------------------+
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Suzie Emery

From: Elaina Smouha [elainamir[redacted]
Sent: Sunday, 16 January 2011 10:14 PM
To: john.bradley[redacted]
Cc: Barry Dennien; Dan Spiller; WaterGridMedia; debbie.best[redacted]; pborrows
Subject: Cabinet in confidence - Ministerial brief - Flood event and Wivenhoe Dam
Attachments: Letter_from_Stephen_Robertson_MP_RE__Release_of_Water_from_Key_Storages[1].pdf; Letter_to_Minister_-_flood_management[1].docx; BrianCooperCV09122010.pdf; Brian Cooper - final report.docx; Brian Cooper - final report attachment.xlsx; Seqwater Ministerial_Briefing_Note_January_17_2011_Final_Draft_for_distribution[1].docx; Seqwater Jan_2011_Flood_Event_Ver_1_draft_for_distribution[1].docx; FINAL Ministerial_Brief_-_Wivenhoe_Operations[3].docx; Talking points_Wivenhoe Dam releases.docx

John

Attached is the Ministerial Brief and accompanying attachments for the Emergency Cabinet meeting scheduled on 17 January 2011.

Regards

Elaina

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SEQ Water Grid Manager
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brian cooper consulting

12 January 2011

Mr. Barry Dennien
CEO, SEQ Water Grid Manager
PO Box 16205
City East QLD 4002

Dear Barry,

This letter report:

- presents my final findings on a review of the operation of Wivenhoe Dam (including controlled releases) for compliance against the Flood Mitigation Manual for the period 12 December 2010 to date (Flood Event), and;
- provides advice on the prudence and appropriateness of the decisions and actions taken during the Flood Event regarding the operation of Wivenhoe Dam in light of the Flood Mitigation Manual's requirements and the circumstances of the Flood Event.

The report follows on from my preliminary report sent to you earlier today. The findings and advice are provided on the basis of information provided by SEQ Water Grid Manager which comprised the Flood Mitigation Manual and Technical Situation Reports. The latter were daily (sometimes twice daily) reports for the subject period. They gave a log of rainfall over the dam catchments and the downstream river (Lockyer Ck. and Bremer R.) catchments; inflows to Somerset and Wivenhoe Dams; storage levels; releases from the dams; details of the operation of gates and other outlets (gate openings/discharges); proposed changes in operating strategies and impacts on the various access crossings downstream of Wivenhoe Dam. In reviewing the Technical Situation Reports, I prepared a spreadsheet (see separate attachment of Excel spreadsheet *Tech Reports – Summary*, summarising the reports so that a timeline of the Flood Event could be seen at a glance. This provided a good overview of the Flood Event as it unfolded and showed what information may or may not have been included in a particular report. The Queensland Director Dam Safety (Water Supply) informed me that the Flood Operation Logs contain much more detailed information including details of the communications that were carried out and some of the more detailed information that is not necessarily included in the Technical Situation Reports. I have been provided with a draft of the "*Protocol for the Communication of Flooding Information for the Brisbane River Catchment – Including Floodwater Releases from Wivenhoe and Somerset Dams*" developed in October/November last year and currently being used. The Technical Situation Reports appear to have been an outcome of that Protocol.

The various requirements and required actions detailed in the Flood Mitigation Manual are summarised in the Table given in Attachment A. The Table also gives my comments (where appropriate) on whether there is evidence from the information presented to me, that there is satisfactory compliance with these requirements and actions.

The main aspects of the Flood Mitigation Manual are the various strategies for operating Wivenhoe Dam and Somerset Dam as well as a number of requirements relating to flood operations personnel, flood preparedness and flood training.

At Wivenhoe Dam there are four main strategies for operating the dam (W1 to W4) and at Dam there are three (S1 to S3). These strategies are hierarchical and are based on a number of flood objectives. These in descending 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 (FSL) at the conclusion of the Flood Event, and;
- Minimise impacts to riparian flora and fauna during the drain down phase of the Flood Event.

Normal procedures require a return to FSL within 7 days of the flood event peak passing through the dams so that the potential effects of closely spaced Flood Events can be allowed for.

It is apparent from the Technical Situation Reports that emphasis has been given to communicating changes in flood operations strategies with local authorities and the Bureau of Meteorology (BOM).

Until the last day or so, Wivenhoe Dam has been below EL74.0 and accordingly, would be operating under Strategy W1 i.e. make releases such that bridges downstream of the dam do not have to be closed prematurely. For a few days at the end of December and for the last day or so before yesterday's big rise, Strategy W2 would be in place (restrain releases from Wivenhoe Dam such that Brisbane River flows are maintained within the upper limit of non-damaging floods at Lowood (3,500 m3/s)). At various times during the Flood Event some of the downstream bridges have been closed. However, it is evident that action has been taken to vary dam releases such that various bridges could be re-opened as soon as possible. This appears to have been done in accordance with the flood operating strategies. The operations then moved onto Strategy W4 when the storage in Wivenhoe Dam reached about EL 73.5 (before the W4 trigger level of EL 74) when yesterday's heavy rain came on and it was assessed that there was a chance that the first (central) fuse plug could be triggered. It was then a matter of juggling the radial gate openings in an attempt to circumvent any fuse plug triggering. A graph of storage levels for Wivenhoe and Somerset Dams (from information taken from the Technical Situation Reports) showing the limits for the various Wivenhoe Dam flood strategies is given in Attachment A. It is apparent from this graph, that the appropriate flood operation strategies were adopted. The Technical Situation Reports indicate that proposed changes in strategy were appropriately communicated with appropriate authorities in accordance with the new Communication Protocol.

Summary:

The Technical Situation Reports comply with the requirements of the new Communication Protocol. However, I feel that there could be more consistency in the information presented. There seem to be gaps in information presented such as storage levels (see spreadsheet and graph in Attachment A). It would be useful to specify the minimum information required to be presented in the Technical Situation Reports (storage levels, inflows, recent/current rainfall, forecast rainfall, releases from dams, estimated flows from downstream tributaries, current flood operating strategy for each dam and proposed change in strategy, gate and regulator operations, state of downstream road crossings etc). Most of the minimum information is already given, but not in a consistent manner. As a means of reviewing processes followed during a flood, it would be useful to present a timeline of the flood event showing graphs of storage levels and other data that can be easily presented in a graphical manner.

I am informed by the Queensland Director Dam Safety (Water Supply) that the various requirements of the Flood Mitigation Manual relating to requirements for flood operations personnel, flood preparedness and flood training have been adhered to. There are a number of other requirements however, that I am not able to say whether they were satisfied as I had insufficient information. These requirements (see Table in Attachment A) should be subject to a separate audit.

It appears to me that the decision to implement Strategy W4 was a prudent one. While it would cause some damage in the Brisbane River downstream, its implementation, considering forecast rainfalls and projected flows in Lockyer Ck. And the Bremer River, would allow reduction of the storage level in

Wivenhoe Dam. This reduction in storage level would hopefully provide a sufficient buffer that would minimise the chance of a fuse plug triggering in the auxiliary spillway. Triggering of the first (central) fuse plug would cause a sudden increase of flow of some 2,000m^3/s from Wivenhoe Dam. This increase in flow would cause significantly more flooding in the lower Brisbane River than that caused by early implementation of Strategy W4.

Conclusions:

The strategies as set out in the Flood Mitigation Manual have been followed, allowing for the discretion given to making variations in order to maximise flood mitigation effects. The actions taken and decisions made during the Flood Event appear to have been prudent and appropriate in the context of the available knowledge available to those responsible for flood operations and the way events unfolded.

There are a number of requirements where there was insufficient time given the urgency of this review, to source the necessary information for me to demonstrate compliance. However, satisfaction or otherwise of these requirements would have had little impact on the operation of the two dams during this particular Flood Event. It is intended that they be audited when time permits, after the Flood Event.

There are aspects of the Technical Situation Reports that could be improved and these have been discussed above.

Regards,

[redacted]

Brian Cooper

ATTACHMENT A

Action Requirements extracted from the Flood Mitigation Manual:

Action	Comment
The Flood Mitigation 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.	Appears to have been done
Sufficient numbers of suitably qualified personnel are available to operate the dams if a Flood Event occurs.	Director of Dam Safety is satisfied
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.	See Note 1
A regular process of internal audit and management review must be maintained by Seqwater to achieve improvements in the operation of the RTFM.	See Note 1
Seqwater must 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.	See Note 1
Seqwater must 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.	See Note 1
Seqwater must ensure that all available data and other documentation is appropriately collected and catalogued for future use.	See Note 1
Seqwater must ensure that information relevant to the calibration of its field stations is shared with appropriate agencies.	See Note 1
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: • Bureau of Meteorology (issue of flood warnings for Brisbane River basin); • Department of Environment and Resource Management (review of flood and discretionary powers); • Somerset Regional Council (flood level information for upstream of Somerset Dam and upstream and downstream of Wivenhoe Dam); • Ipswich City Council (flood level information for Ipswich), and; • Brisbane City Council (flood level information for Brisbane City).	Required also by draft of Communications Protocol. Technical Situation Reports infer compliance
Seqwater must report to the Chief Executive by 30 September each year on the training and state of preparedness of operations personnel.	See Note 1
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.	See Note 1

Action	Comment
After each significant flood event, Seqwater must report to the Chief Executive on the effectiveness of the operational procedures contained in this manual.	It is too early for this action to be implemented. Will be implemented when the Flood Event is finished
Prior to the expiry of the approval period, Seqwater must review the Manual pursuant to provisions of the Act.	It is too early for this action to be implemented
Strategies are changed in response to changing rainfall forecasts and stream flow conditions to maximise the flood mitigation benefits of the dams.	Technical Situation Reports indicate that this is done
When determining dam outflows within all strategies, peak outflow should generally not exceed peak inflow.	Information from Seqwater indicates that the requirement was satisfied
Protocol for use of discretionary powers (i.e. who gets told)	Director of Dam Safety is satisfied – I don't know whether Seqwater CEO or Chairperson approved – See Note 1

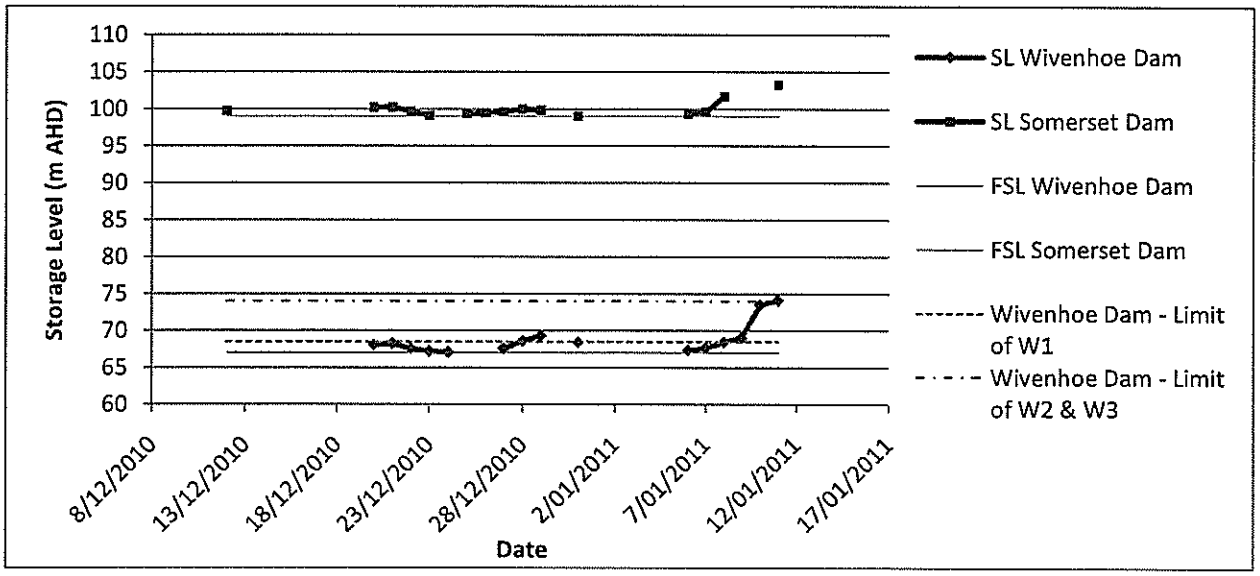
Note1: For a number of the above actions, given the short time frame for the review on compliance of actual flood operations with the Flood Mitigation Manual, it was not possible to source some of the information required to confirm that requirements had been fulfilled. These actions will be audited separately, when time permits.

Action	Comment
Flood Strategies for Wivenhoe Dam:	
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 . 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.	Technical Situation Reports indicate that every attempt was made to keep the specified road crossings open
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:	Technical Situation Reports indicate that Wivenhoe Dam releases were made considering concurrent flows in the Bremer River & Lockyer Ck. To delay damaging floods as long as possible
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.	
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 EL74.0 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. There are no restrictions on gate opening increments or gate operating frequency once the storage level exceeds EL74.0 AHD, as the safety of the dam is of primary concern at these storage levels.	Technical Situation Reports indicate that Wivenhoe Dam releases were such as to delay adopting this strategy as long as possible
Where possible, total releases during closure should not produce greater flood levels downstream than occurred during the flood event.	Technical Situation Reports indicate that this requirement was satisfied
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.	Technical Situation Reports indicate that

Action	Comment
	emphasis was given to satisfying this requirement
Flow in the spillway to be as symmetrical as possible with the centre gates opened first.	Technical Situation Reports indicate that this was done
The bottom edge of the radial gates must always be at least 500mm below the release flow surface.	See Note 1 above

Action	Comment
Flood Strategies for Somerset Dam:	
The intent of Strategy S1 (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) 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.	Technical Situation Reports indicate that this was done
The intent of Strategy S2 (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). This to maximise the benefits of the flood storage capabilities of the dam while protecting the structural safety of both dams. The Flood Mitigation Manual contains a graph that shows the intended interaction of the Wivenhoe Dam and Somerset Dam storage levels.	Technical Situation Reports indicate that this was done – little information on the operation of the radial gates at Somerset Dam. How the graph was followed not really demonstrated
The intent of Strategy S3 (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) is to maximise the benefits of the flood storage capabilities of the dam while protecting the structural safety of both dams.	Not relevant at this stage
The safety of Somerset Dam is the primary consideration and cannot be compromised and its peak level cannot exceed EL 109.7.	Maximum level only EL103.3

Wivenhoe & Somerset Dams – Storage Level Behaviour (as presented in Technical Situation Reports)



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 dan.spiller[redacted].

Yours sincerely

[redacted]

Gary Humphrys
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.

brian cooper consulting

Brian Cooper

Dams Engineer

Qualifications & Affiliations

Short courses on finite element analysis, embankment dam engineering, earthquake engineering. Published technical papers – ICOLD. ANCOLD and I.E. Aust. Attended dam safety course at USBR (Denver, USA) in 2002

Bachelor of Engineering (B.E. Hons), 1968 and Master of Engineering Science (M.Eng.Sc.), 1971

University of New South Wales

Graduate Diploma of Engineering Management, 1994 Deakin University

F.I.E. Aust.,C.P.Eng. RPEQ

Expertise

Brian has approximately 40 years experience in investigation and design of major dams, weirs and hydraulic structures, having started his career designing farm dams and small irrigation schemes. He retired from NSW Department of Commerce in 2005. Brian now works as a private consultant specialising in dams engineering and fish passage at dams and weirs. He has a special interest in risk assessment and computer modelling in general and the seismic analysis of dams in particular. Engineering software (concrete dam stability analysis and flood routing) written by Brian is still used extensively in the Dams & Civil Group of the Department of Commerce. He also has particular experience with concrete dams and the use of post tensioned ground anchors for strengthening those dams. He was a member of the Australian National Committee on Large Dams (ANCOLD) Working Group that developed guidelines for 'Design of Dams for Earthquakes' and a member of the Working Group that revised the guidelines for 'Risk Assessment for Dams'. He has been a guest lecturer for a number of years (most recently in 2009) on concrete dam engineering for the University of NSW post graduate Embankment Dam Engineering Course, and on the history of dams in NSW at Sydney University.

He has been the project director and project manager for a number of feasibility studies, design reviews, site investigations and detail design consultancies for major dams and weirs including the direction and co-ordination of all specialist services including dambreak studies, preparation of dam safety emergency plans and risk assessments. He is currently an expert reviewer for a number of Australian water authorities and consultants (State Water Corporation (NSW), Hydro Tasmania, SunWater (Queensland), Brisbane City Council, Goulburn-Murray Water, Goulburn Valley Water, WA Water Corporation, Southern Rural Water (Victoria), URS, GHD, Hobart Water, NT PowerWater, and TrustPower (NZ)). He has also worked as a sub-consultant for a number of consulting firms (URS, MWH, GHD).

Brian is the Engineers Australia representative for the NSW Dams Safety Committee (the dam safety regulator in NSW) and is currently the Chairman of that organisation. He has been a member of the Murray Darling Basin Authority's Fish Passage Task Force which advises inter alia on the installation of fishways on the Murray River as part of the Living Murray Program.

Brian is a registered engineer in Queensland (RPEQ No. 6819). He started his own consulting business in 2008, advising on dam safety, dam design and analysis, dam risk assessments and dam upgrades as well as fish passage for dams. He is providing specialist advice through *Brian Cooper Consulting* as a sole trader.

Professional Experience

2008 to Present: Principal of Brian Cooper Consulting

2010
Five yearly comprehensive dam safety inspection of Carcoar Dam (double curvature arch dam).
Internal reviewer to URS (Melbourne) on concept design of regulator structures and associated fishways for the Hipwell Road project for watering the Gunbower Forest
Specialist adviser to Melbourne Water – valve behaviour on Sugarloaf Dam pipeline, structural behaviour of pumping station floor slab and pump bases at Cardinia Dam Pumping Station
Commenced work as member of ANCOLD working group re-writing the Earthquake Guidelines – responsible for re-writing sections relating to concrete dams.
Continuing involvement with Alluvium in the design of the weir upgrade and the new fishway for Booligal Weir.
Continuing external peer review services to State Water Corporation for the detail design of new auxiliary fuse plug spillways for Copeton and Chaffey Dams, detail design of raising and post tensioned strengthening of Keepit Dam, detail design of upgrade works for Wyangala Dam, finite element analysis of Carcoar Dam (double curvature arch dam).
Further work with GHD (Perth) on risk assessment for Serpentine Dam.
Continuing involvement with Hydro Tasmania, as Chair of external review panel for Catagunya Dam.

2009
Part of URS' comprehensive inspection team for Melbourne Water's Maroondah Dam.
Part of URS' business risk assessment team for Southern Rural Water's Cowwarr and Maffra Weirs.
Part of Alluvium's design team upgrading Booligal Weir and providing a fishway at the weir, for State Water Corporation.
Part of GHD's design team for Lower Fitzroy River Infrastructure Project designing fishways for Rookwood and Eden Bann Weirs near Rockhampton in Queensland.
Project Manager on behalf of SA Water and reviewer for study into vibration of a crane rail beam at Lock 5 on the River Murray.
Expert reviewer for State Water Corporation for 3D finite element analysis of Carcoar Dam (double curvature arch dam).
Internal reviewer for URS on Laanecoorie Dam Upgrade.
Expert reviewer for State Water Corporation for risk assessments for Oberon and Rydal Dams.
Member of GHD's Serpentine Dam risk assessment team for WA WaterCorp.
Expert reviewer for SunWater in Queensland for the comprehensive risk assessment undertaken for Fairbairn Dam and Coolmunda Dam.
Expert reviewer for State Water Corporation for major upgrade works at Keepit, Copeton, Chaffey and Wyangala Dams.
Appointed as Chairman of the NSW Dams Safety Committee (the dam safety regulator in NSW).
Provided external peer review for Goulburn Valley Water, on Nine Mile Creek Dam Upgrade.
Internal reviewer for URS (Adelaide) for Lake Victoria Outlet Regulator options studies.
Provided advice to URS (Melbourne) on the Mildura Weir Fishway design.
Member of expert panel advising State Water Corporation on revised dam surveillance regime.
Part of Ecosmart bid team - prepared concept designs for fish passage facility at proposed Wyaralong Dam in Queensland.
Continuing expert review role for Catagunya Dam upgrade.

2008
Started as a private specialist dams consultant - *Brian Cooper Consulting.*
Worked through the URS Corporation for the USBR and the USACE in developing a risk toolbox for lined spillways.
Advised TrustPower in New Zealand on replacement of post tensioned anchors at Mahinerangi No. 1 Dam.
Adviser to State Water Corporation and to URS on further upgrade works for Hume Dam.
Provided specialist advice to WA Water Corporation on Wellington Dam post tensioning.
Peer reviewer on behalf of URS for Warren Dam in South Australia.
Part of URS team carrying out portfolio risk assessment of Melbourne Water's dams.
Member of Expert Review Panel for Darwin River and Manton Dams for NT PowerWater.

1987 to 2008: Dams & Civil Section of NSW Department of Public Works and Services/NSW Department of Commerce.

2008 Carried out detailed 3D finite element analysis of radial gate at Wyangala Dam spillway for State Water Corporation.
Continuing review role for Tillegra Dam.
Continuing review role for Hinze and Lake Manchester Dams in Queensland and Catagunya Dam in Tasmania.
Prepared options report on Burrendong Dam spillway modifications for State Water Corporation.

2007 Continuing roles on Lake Manchester, Hinze, Catagunya and Redbank Ck. Dams.
Internal peer reviewer for NSW Dept. of Commerce regarding design of Tillegra Dam.
Advised State Water on feasibility of fish passage facilities at a number of their major irrigation dams.
Expert reviewer for GHD on a flood retarding basin in south west Sydney.
Part of expert panel for River Murray Water risk assessments for Hume and Dartmouth Dams, Torrumbarry and Yarrowonga Weirs and Lake Victoria.
Re-elected as Deputy Chairman of the Dams Safety Committee

2006 Project director for 3D finite element analysis of Bendora Dam (double curvature arch dam)
Chair of external peer review panel for upgrading of Lake Manchester Dam (concrete gravity dam) in Queensland
Internal peer reviewer and senior consultant for the raising of Hinze Dam (earth and rockfill embankment) in Queensland
Project director for preliminary and detailed design of Redbank Creek Dam (single curvature arch dam) upgrading
Project director for Keepit Dam fish passage investigations
Part of expert panel for URS undertaking portfolio risk assessment for dams owned by River Murray Water
External peer reviewer for Hydro Tasmania for Catagunya Dam (concrete gravity dam) upgrading;
Project director for 3D finite element analysis of Upper Cordeaux No. 2 Dam (single curvature arch dam owned by SCA) for BHP Billiton

2005 Project design engineer for dam related aspects of Nepean Dam Deepwater Access Project: Pipeline crossing end of spillway; outlet works for end of pipeline
Project design engineer for Avon Dam Deepwater Access Project: tunnel design through rockfill buttressing; new low level outlet works

2004 Internal reviewer to URS Australia for Pykes Ck Dam Investigations (Southern Rural Water, Victoria)
Internal reviewer to URS Australia for Lower Reservoir Dam (Hobart Water, Tasmania)
Member of expert review panel for the Melton Dam upgrade design (Southern Rural Water, Victoria)

2003/04 Designer for retrofitting multi-level offtake for Tallowa Dam (Sydney Catchment Authority).
Member of the Independent Technical Expert Panel for the Eildon Dam Upgrading in Victoria for Goulburn-Murray Water.
Currently the design director for the Wivenhoe Dam Alliance carrying out the flood capacity upgrading for Wivenhoe Dam in Queensland – included directing major computational fluid dynamics modelling investigations of existing spillway

2003 Carried out options study for environmental upgrading works at Keepit Dam (selective withdrawal facility, additional outlet works and fish passage)
Carried out assessment of spillway capacity for Hume Dam using computational fluid dynamics modelling (by a sub-consultant)
Carried out detail design for anchoring Bellfield Dam (Victoria) Intake Tower
Carried out detailed finite element analysis of Keepit Dam radial gates

2002 Carried out review of large farm dam with seepage problems. Directed computational fluid dynamics modelling of drum gate and radial gates at Warragamba Dam together with structural analysis of gates (modelling carried out by sub-consultant) to ensure gates can handle more

rigorous operating conditions
Adviser to the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) on civil engineering matters related to the replacement reactor project at Lucas Heights
Expert reviewer for Goulburn-Murray Water for remedial works at Cairn Curran Dam in Victoria
Project Director for Lerderderg Weir safety review and risk assessment for Southern Rural Water (Victoria). Carried out finite element analysis of radial gate

2001

Project Director for design of further remedial works at Hume Dam.
Technical director on behalf of NPWS for quantitative risk assessment for Snowy Mountains roads
Chairman of the committee producing a geotechnical response plan for the Alpine Way in the Snowy Region for NPWS
Carried out non-linear finite element analysis (earthquake loading) for outlet tower at Bellfield Dam for Wimmera-Mallee Water (Victoria)
Joined the MDBC's Fish Passage Reference Group and reviewed fishway designs
Consultant to DLWC for their portfolio risk assessment of thirty dams
Provided advice on the post tensioning system at Waitakere Dam in New Zealand.

Director of Dam Surveillance Group responsible for the surveillance of DLWC dams and participant of a number of 5 yearly surveillance inspections
Project Director of review of DLWC Intake Towers Earthquake Stability Review
Directed DPWS input into the Earthquake Stability of the structural elements of Yarrawonga Weir as sub-consultant to URS Australia – included detail design of anchoring system for the weir. Also provided design advice on design of stone columns to provide protection against liquefaction of alluvial foundations.
Member of the expert panel for the risk assessment studies being undertaken for Goulburn-Murray Water
Project Director for safety review and preliminary design of remedial options for Blowering Dam (DLWC)
Acted as reviewer for a number of projects carried out by URS (incl. Cardinia Dam outlet tower, Bellfield Dam embankment/spillway)
Directed functionality study (including business risk assessment) for Yallourn Weir for Southern Rural Water (Victoria)

2000

Project Director for design of further investigations and remedial works at Hume Dam.
Safety reviews for Bamarang and Flat Rock Dams
Director of Dam Surveillance Group responsible for the surveillance of DLWC dams and participant of a number of 5 yearly surveillance inspections
Project Director for earthquake studies on intake towers and appurtenant works at DLWC dams
Consultant to DLWC to manage their portfolio risk assessment
Project Director for a number of dambreak studies and preparation of dam safety emergency plans
Member of the consulting team carrying out risk assessments for Goulburn-Murray Water (Victoria) for Eppalock Dam
Carried out review of Earthquake Stability Review of the Outlet Tower at Eppalock Dam in Victoria for G-MW.
Reviewed URS Australia designs for Alpine Way remedial works

1999

Project Director of earthquake studies on Wyangala Dam
Project Director for design of further remedial works at Hume Dam. Included design of ground improvement works (stone columns) for protecting alluvial foundations against liquefaction
Peer reviewer of Leslie Dam (Queensland) Safety Report.
Peer reviewer of DLWC's Screening Level Risk Assessment

1998

Project Director for portfolio risk assessment for six dams owned by a Southern Rural Water in Victoria.
Directed structural analysis of spillway gates on Narracan Dam for Southern Rural Water
Project Director for concept design and DD&C contract documentation for Warragamba Dam auxiliary spillway. Dam to be upgraded the dam to cater for increased inflow flood estimates. Upgrading works estimated to cost $135M. An auxiliary spillway is to be constructed adjacent to the existing dam - involves excavating some 2,000,000m³ of rock and constructing concrete lining, training walls, fuse plug embankments, large scale cement stabilised sandstone fill, a multi

span bridge across the spillway, post tensioned ground anchors for dissipator/training walls, modifications of existing spillway gates. Design involved extensive physical hydraulic model testing.

1997 Feasibility options study for remediation of Redbank Ck. Dam near Mudgee (NSW) Karapiro Dam, New Zealand - Part of international consulting team reviewing this concrete arch dam's security and determining appropriate remedial options (mass concrete buttressing). Director of risk assessment studies for Tenterfield Dam

1993-1997 Hume Dam Investigations - Project Manager of Investigation and Design Studies for the embankments at the dam. Work involves:

- review of the stability of the embankments under static and earthquake loadings
- investigation of liquefaction
- potential of embankments' foundations
- development of stabilising options
- development of options to provide increased flood security including provision of new auxiliary spillways and modifications to existing works

- detail design and documentation of stabilising works for the embankments including a key trench into the dam's foundations, stabilising berms, slurry wall cut-offs, drainage/filter curtains and strengthening of critical gravity training walls with both horizontal and vertical post tensioning.

- part of advisory and review team for the risk assessment of the dam and its components.

1990-1996 Warragamba Dam Upgrading for Sydney Water Corporation - Project Manager of Investigation Concept Design Studies for upgrading the dam to cater for increased inflow flood estimates and provide substantial flood mitigation. Upgrading works estimated to cost $280M. The existing dam was to be strengthened with mass concrete buttressing – some 600,000m³.

1996 Project Director for Safety Review (including Finite Element Analysis) of Wellington Dam

1993-1996 Hume Dam Gates for Department of Water Resources - Project Manager for the design of new maintenance baulks and emergency closure gates. Involves development of proposals for underwater installation.

1995 Redbank Creek Dam and Lithgow No. 2 Dam for NSW Public Works Dams Surveillance - Project Manager for safety reviews and finite element analysis of two 15m high arch dams. Clarrie Hall Dam for NSW Public Works Dams Surveillance - Project Manager for dambreak studies.

1994 Burrinjuck Dam Gates for NSW Department of Water Resources - Project Manager for the design of new control and emergency closure gates. Involves underwater installation. Karangi Dam for Coffs Harbour City Water Project - Project Manager for dambreak studies.

1993 Mardi Dam for Wyong Council - Project Manager for safety review of earth embankment.

1988-1990 Nepean Dam Remedial Works for Sydney Water Corporation - Project Manager for investigation studies, design development and detail design. Work involved:

- initial flood security studies and development of options
- co-ordination of hydraulic model studies
- detail design and contract documentation for modified spillway, large size post-tensioned ground anchors and rockfill buttressing.

1987-1989 Boggabilla Weir for NSW Department of Water Resources - Project Manager for detail design and contract documentation of a large gated re-regulation weir with fishway. Involved liaison with fisheries expert in developing optimum geometry for fish ladder.

Chaffey Dam for NSW Department of Water Resources - Project Manager for upgrading of dam. Work involved:

- development of options and preliminary design
- finite element analyses for raised morning glory spillway
- stability analyses for raised earth/rockfill embankment
- co-ordination of hydraulic model studies for raised spillway.

1969-1987: ***Water Resources Commission of NSW (WRC) (now Department of Land and Water Conservation).***

1986-1987 Flood Security studies for WRC - Project Design Engineer for investigation into flood security of Chaffey and Glennies Creek Dams. Involved co-ordinating dambreak studies, development of remedial options, economic risk studies.

1985-1987 Hume Dam Strengthening for WRC - Project Design Engineer for detail design and contract documentation. Work included:

- design of large size post-tensioned ground anchors including development of appropriate grouting procedures
- design of structural modifications to the concrete gravity dam
- design of a new road bridge over the dam.
- establishing the rationale for replacing the existing post tensioning system

Contact

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Mobile: [redacted]
Email: brian.cooper.consult[redacted]

Queensland Government

Ref CTS 19311/10

25 OCT 2010

Mr Gary Humphrys
Chair
SEQ Water Grid Manager
PO Box 16205
CITY EAST QLD 4002

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

Dear Mr Humphrys

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.

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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

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Date	Time	TSR	Wivenhoe Dam Release (m^3/s)				Gate No.	Opening (m)	Storage Level	Rainfall (mm)
			Regulators	Hydro	Gates	Total				
12/12/2010	1400	W1								
13/12/2010	1300	W2		10	290	300				
15/12/2010	1800	W3								
16/12/2010	1600	W4			0					
										Large storms yesterday pm and night; 20-50 forecast tonight
17/12/2010	1200	W5								
17/12/2010	1800	W6	Closed		Opening Op. Initiated					20-50 forecast o/n
	1830			13	50	63	3	0.5		
18/12/2010	0700	W7								40-50 since 16/12/2010
19/12/2010	0700	W8			350	350	3	3.5		20-30 upper Brisbane R.
19/12/2010	1800	W9			300	300	3	3		
20/12/2010	0700	W10								
20/12/2010	0900	W11							68 expected this afternoon	
20/12/2010	0900	W12								
21/12/2010	0730	W13				peak 1,280 (0500)			peak 68.24 (0400); currently 68.22 (112% cap.) falling slowly	
22/12/2010	0830	W14							currently @ 67.61 (107% cap.) falling slowly	none since 300 on 20/12/2010
22/12/2010	1600	W15			Closing sequence				to finish just>FSL	
23/12/2010	0800	W16			All gates expected to be closed by 1500				When gates closed, will be 67.2 (0.2m > FSL) & 50mm <gate opening trigger level	
23/12/2010	1430	W17			350		3	3.5	67.23	10-30 in CA over last 24 hrs.; further heavy rain expected to start on 29/12/2010
24/12/2010	0630	W18			All gates expected to be closed by 1300				67.07 expected when all gates closed	little or no rainfall
24/12/2010	1330	W19	4,200Ml/day from reg. & Hydro		Radial gate ops ceased @ 1300		3 zero			
25/12/2010	0930	W20								10-20 over last 24 hrs

26/12/2010	0800	W21				Rel. minor over last 24 hrs.
27/12/2010	0800	W22				40-50 over dam CA last 24 hrs.
28/12/2010	0700	W23	347 (initially) then back to 46			20-40 over dam CA's ;ast 24 hrs
29/12/2010	0700	W24			69.26 (@ 0600) - aim is to return to FSL by 2/1/2011	No/very little in last 24 hrs.
30/12/2010	0700	W25	Wivenhoe+Lockyer = 1,600m³/s		69.33 peak yesterday @ 1200 (2.3m > FSL) 69.07 this am	No/very little in last 24 hrs.
31/12/2010	0700	W26 W27	Wivenhoe+Lockyer = 1,600m³/s		68.4 @ 0500	No/very little in last 24 hrs.
06/01/2011	1200	W28	Commence opening RG @ 1800 & ramp up to 300m³/s by 2200		67.31 @ 0700	20-30 widespread with up to 50 on dam CA's
07/01/2011	0700	W29			67.64 @ 0600	30-50 with isolated falls up to 75; signif. Rain on Lock. Ck.
07/01/2011	1500	W30	Release started 1500 to be incr. slowly to ~1,200m³/s by 1400 tomorrow			
08/01/2011	0700	W31	~890	All (5) RG's open	68.45 @ 0600 rising steadily	Widespread rain 20-40 over dam CA's since 0900 yesterday; further high rainfall predicted for next 4 days
09/01/2011	0700	W32 W33	1,343		Currently 68.58 (falling slowly)	For last 12 hrs. av. of 40 for Somerset CA & <10 for Wivenhoe CA
09/01/2011	2100	W34	1,400		Currently @ 69.1;	Very heavy rainfall -totals for 24 hrs 100 - 300; Severe weather warning for heavy rainfall

		W35				
		W36				
		W37				
11/01/2011	0630	W38	2,750 since 1930 on 10/1/2011	All (5) gates	73.51 rising @ 25mm/hr.	20-60 last 12 hrs in Lockyer CA; 30 in Bremer R.; Isol. Falls of 125 in upper Brisbane R. & widespread falls of 40 - 70 in Somerset CA
11/01/2011	1200	W39	3,970		74.1 (179.5% cap.) rising @ 25mm/hr.	

Comments	Crossing Closures
45,000Ml from Somerset; WL|Somerset to peak at 99.7 on 13/12/2010; 150m^3/s expected through Brisbane; 30,000Ml expected into Wivenhoe from upper Brisbane R.; peak WL in Wivenhoe expected to be 67.6; Releases expected from Wivenhoe on afternoon of 13/12/2010 ramping up to 300m^3/s; Reg. will be closed & Gate 3 opened to 3m to get WL back to 67.25; Incr. release will impact on 3 crossings; Dam Regulator informed	
138m^3/s from Somerset;	Gate release will impact on 3 crossings
Releases from Wivenhoe will cease on 16/12/2010; Hydro will continue during fish recovery ops.	
Gate closed 1000	
Decision to commence a release tonight was made this am by Duty Flood Engineers to provide as much notice to impacted Councils as possible; 60,000Ml needs to be released from Wivenhoe & Somerset to maintain FSL	
Need to release >60,000Ml from Wivenhoe & Somerset to achieve FSL	
Releases could increase to 300m^3/s;	Would impact Twin Bridges, Savages Crossing, Colleges Crossing
100,000Ml to be drained in next 4 days; Q|Brisbane R. to be maintained at 300-350m^3/s;Transfer from Somerset via 2 reg.; Wivenhoe Q incr. to 150m^3/s o/n; Will incr. further to 300m^3/s as Q|Lock.Ck. Subside over next 24 hrs.; Q|Lock.Ck. Currently 130m^3/s	Twin Bridges & Savages Crossing currently closed; Colleges Crossing to be impacted in afternoon
12,000Ml/day from Somerset; Release expected until 22/12/2010;	Twin Bridges, Savages Crossing, Colleges Crossing currently closed
Somerset rel. steady (Q|reg.=140m^3/s); Q|Wivenhoe to be maintained at 300m^3/s (Lock.Ck. Permitting) to allow Burtons Bridge to remain open; WL|Wivenhoe expected to incr. to 67.4 over next 2 days;	Twin Bridges, Savages Crossing and Colleges Crossing are closed; closing of Burtons Bridge and Kholo Bridge will be considered if more rain or inflows
Somerset risen to 100.2 - sluice gate releases to be made until am of 22/12/2010 when FSL expected; WL|Wivenhoe at 68 expected this pm; Q|Wivenhoe expected to be >1,200m^3/s - discuss with impacted Cncls.- strategy decision by 10000; Wivenhoe inflows excl.	
Q|Somerset peak tomorrow at 1800m^3/s	Both Burtons and Kholo bridges likely to be inundated
Inflow to Somerset to peak today at 700m^3/s; Somerset & Wivenhoe currently storing 140,000Ml above FSL; further inflows occurring; releases to be incr. o/n to ~1,200m^3/s; various Cncls. Given heads up; BOM advised	Wivenhoe releases reduced slightly to keep Burtons Bridge open - then incr. releases after Somerset RegnlCncl inform residents affected by Burtons Bridge
Same as W11	
410m^3/s from Somerset sluice gates; Somerset peaked @100.43 (1300 on 20/12/2010), currently @ 100.23 (114% of cap.); 110,700Ml Inflow to Somerset,67,500Ml discharged into Wivenhoe; Wivenhoe inflow (excl. Somerset releases) = 157,900Ml, 103,000Ml released; Total Inflow to both dams ~310,000Ml; Continued gate operations may be necessary if forecast rainfall results in subsequent river rises	Kholo Bridge is also expected to be inundated by mid-morning ; In accordance with the adopted operational strategy these bridges should be back in service by late Thursday and all bridges (with the possible exception of Twin Bridges) should be trafficable for Christmas providing no further rainfall occurs.
410m^3/s from Somerset sluice gates; Somerset currently @ 99.68 (108% cap.); 121,500Ml inflow to Somerset, 103,000Ml released to Wivenhoe; Gate Ops. @ Wivenhoe; High tides expected to coincide with peak levels in Brisbane R.	Burtons Bridge & Kholo Bridge expected to be back in service by 23-24/12/2010; All bridges expected to be trafficable by Xmas provided no further rain
BOM aware of all releases	Gate closing sequence to allow bridges to be accessible
1 sluice open @ Somerset to be closed @ 0900 - WL will be 0.1m> FSL; Est. Inflow to Somerset 135,000ML, majority discharged into Wivenhoe; Gate closure ops @ Wivenhoe in progress; Wivenhoe inflow (excl. Somerset inflow) = 204,000Ml; A total of 324,000Ml has been released; Contd. gate ops may be necessary if forecast rain results in river rises; Gate closure ops sequence to be reviewed	Projected crossing openings: Burtons Bridge – 18:00 Thursday 23 December 2010. Savages Crossing – 19:00 Thursday 23 December 2010 Kholo Bridge – 21:00 Thursday 23 December 2010 Colleges Crossing – 08:00 Friday 23 December 2010
Somerset gate ops ceased @ 0900, WL @ 99.1; Gate closure sequence extended to pm of 24/12/2010; Contd. Gate ops may be necessary if forecast rainfall gives incr. river levels	Projected crossing openings: Burtons Bridge – 18:00 Thursday 23 December 2010, Kholo Bridge - 21:00 Thursday 23 December 2010; Other bridges expected to remain closed until Xmas Day
Gate ops @ Somerset ceased yesterday, reg. to be opened to bring lake to FSL; Gate ops continuing @ Wivenhoe -1 gate incr. every 5-6 hrs to ensure Brisbane R. Q not incr. due to incr. Lock. Ck. Outflows & maintain Burtons Bridge open;	Twin Bridges, Savages Crossing and Colleges Crossing are currently closed and should remain so for some time due in part to current outflows into the Brisbane River from Lockyer Creek that will peak in excess of 200 cumecs late today.
Flood Centre to monitor o/n & consider options tomorrow am based on inflows & rainfall; further gate ops may be necessary in coming days	Twin Bridges, Savages Crossing and Colleges Crossing may still be affected by flows from the Lockyer.
Somerset WL incr. from 99.18 yesterday @ 0600 to 99.33 @ 0730 today; 99.5 tomorrow if no gate ops.; Wivenhoe currently 4,200Ml through hydro & reg.; 15,00Ml expected just from upper Brisbane R. in next few days; WL cont. to fall in Lock. Ck; Small rises expected in Bremer & Warrill systems; WL in Wivenhoe incr. to 67.28 @ 600	Twin Bridges, Savages and Colleges Crossing remain impacted by Wivenhoe releases and Lockyer and local runoff. Burtons and Kholo Bridges would be currently unaffected. Kholo will no doubt still be closed by Council regarding repairs.

BOM issued severe weather warning @ 0 445; Somerset WL incr. to 99.46 (0.46m> FSL) - 2 regs. To be opened today (140m^3/s); Wivenhoe WL incr. to 67.37 (0.37m > FSL); RG to be opened later today following discussions with local authorities; further gate ops may be necessary if rainfall incr. river levels	Crossings downstream of the dam are currently impacted primarily by non-controlled river flows only (no RG releases from Wivenhoe). Lockyer Creek outflows into the Brisbane River are currently in the order of 60m^3/s. Twin Bridges, Savages and Colleges Crossings will be inundated but the plan is to release around 300-350m^3/s depending on flows downstream so as to not impact Burtons Bridge.
BOM continues with severe weather warning & widespread rainfall over dam CA's; 2 regs. @ Somerset giving 139m^3/s release, lake contd. To rise to 99.6 (0.6m> FSL); RG ops @ Wivenhoe commenced yesterday @ 0900, WL contd. To rise to 67.57 (0.57m > FSL);Q|Wivenhoe reduced o/n because of incr. Q|Lockyer to ensure Burtons Bridge remains open; RG @ Wivenhoe wound back as Q|Lockyer incr. > 250m^3/s; Q|Lockyer expected to peak>500m^3/s later today/tomorrow - will innundate Burtons Bridge;When this happens, Q|Wivenhoe will be incr. to get WL back to FSL; further gate ops may be necessary in coming days	Twin Bridges, Savages Crossing and Colleges Crossing currently closed; Burtons Bridge is currently open, but will be closed later today/tomorrow; Kholo Bridge remains unserviceable due to flood damage; No current expectation that either Mt Crosby Weir Bridge or Fernvale Bridge will be impacted by the current event; An updated estimate of the time of closure of Burtons Bridge this afternoon will be provided to Council RG discharge dropped back to 46m3/s to ensure Burtons Bridge can remain open; Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Bridge and Kholo Bridge are currently closed; No current expectation that either Mt Crosby Weir Bridge or Fernvale Bridge will be impacted by the current event; Lockyer Creek outflows being closely monitored and may come close to impacting upon the Mt Crosby Weir Bridge; England Creek access is not impacted yet
Sever weather warning no longer current; Somerset release through regs' ~ 208m^3/s;WL|Somerset incr. to 99.96 (0.96m>FSL) - inflows decreasing; RG opening dependent on Q|Lockyer; Wivenhoe WL currently @ 68.55 (1.55m > FSL); Inflows to Wivenhoe decr.	
Further 2 sluices opened @ Somerset; WL @ Somerset 99.83 & falling slowly, 2 sluices to be closed @ 1200; Intended to incr. Wivenhoe releases so Q|Wivenhoe+Q|Lockyer maintained @ 1,600m^3/s (similar Q to mid Oct &mid Dec 2010)	Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Bridge and Kholo Bridge are currently closed; no current expectation that Mt Crosby Weir Bridge or Fernvale Bridge will be impacted by current event. At this stage, estimated that the flow at Burtons Bridge will fall below the bridge deck on Sunday morning.
2 sluices @ Somerset remain open (405m^3/s) - FSL expected by 6/1/2011; RG closing sequence expected to start mid tomorrow- RG expected to be closed on 2/1/2011	
WL @ Somerset 99.01 (falling from peak of 100.0 - 1200 28/12/2010) - currently 2 regs;	Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Bridge and Kholo Bridge are currently closed
	Twin Bridges, Savages Crossing, Colleges Crossing, Burtons Bridge and Kholo Bridge are currently closed due to inundation
	Not included
Somerset @ 99.34 (0.34m > FSL) & rising slowly; Wivenhoe 67.31 (0.31m > FSL) & rising slowly; Gates will be opened in next 24 hrs; Lockyer Ck peak of about 100m3/s Friday afternoon	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. Gate release would limit mid-Brisbane Q to 400m^3/s ((Burtons capacity 450m^3/s).
100-200mm rain forecast for SE Qld next 5 days; Somerset WL @ 99.58 (0.59m > FSL) rising slowly - currently releasing 35m^3/s; Wivenhoe WL @ 67.64 (0.64m > FSL & > gate trigger level) rising slowly; u/s of dam river levels peaked @ Linville and Gregors Ck gauges; A peak of about 470 cumecs is expected from Lockyer Creek by mid-afternoon; 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 Q|Wivenhoe may be as high as 1,200m^3/s	Q|Lockyer may be of sufficient magnitude to inundate Burtons Bridge; 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, may also later impact upon Burtons Bridge & Kholo Bridge; 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
Somerset releasing 35m^3/s; 50,000Ml into Somerset; Gate release @ Wivenhoe - strategy to be reviewed tomorrow (dependent on further rainfall)	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
Somerset WL @100.42 & rising (0500) - 1 open sluice gate; Water temp. held in Wivenhoe - strategy may need to be reviewed (depend. On confidence in estimates of Wivenhoe inflows); Intended to ramp Wivenhoe up to 1,200m^3/s by 1200 - likely to be incr. next week; since 2/1/2011, ~200,000Ml has flowed into Wivenhoe (incl. Somerset releases), further 180,000Ml expected based on recorded rainfall; ~ 50,000Ml released via reg. & hydro (@50m^3/s)	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.
Somerset currently @ 100.27 - 60mm rain in last 2 hrs will cause significant inflow later today; 405m^3/s being released into Wivenhoe; maintain combined Q of 1,600m^3/s in mid-Brisbane R.	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. Cncls advised of Wivenhoe op. strategy
Not included	
Somerset @ 101.68 rising quickly; 5 sluice gates open releasing ~1,100m^3/s; WL expected to reach 103.5 by am 11/1/2011; River levels u/s Wivenhoe rising fast; Q|Brisbane R. @ Gregors Ck @ 6,700m^3/s; Wivenhoe expected to reach 73.0 by 11/1/2011 - need to incr. Q|Wivenhoe am of 10/1/2011 - crank up to 2,600m^3/s by am 11/1/2011; Attempt to keep combined Q < 3,500m^3/s - < limit of urban damages in the City	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

Not included
Not included
Not included

Somerset WL @ 103.27 & falling slowly ; currently 1,400m^3/s released to Wivenhoe- to be reduced to 500m^3/s later in the day - to ensure flood mitigation of Somerset & Wivenhoe are maximized; BOM provided advice on flash flooding in Lockyer Ck.; WL in Wivenhoe will reach 74 by evening; May need to increase Q further - may result inQ]lower Brisbane R. >5,000m^3/s

Somerset @ 103.3 & rising; Outflows into the Brisbane River from both Lockyer Creek and the Bremer River are also increasing; If no further rain, can hold @ 74.8 - aim is to prevent fuse plug triggering, situation assessed every 3 hrs.; 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.

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; 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.

Suzie Emery

From: Bradley John [John.Bradley[redacted]]
Sent: Sunday, 16 January 2011 10:35 PM
To: Elaina Smouha
Cc: Barry Dennien; Dan Spiller; Best Debbie; pborrows; Reilly Bob
Subject: RE: Cabinet in confidence - Ministerial brief - Flood event and Wivenhoe Dam

Follow Up Flag: Follow up
Flag Status: Flagged

Many thanks to all for thier hard work at the end of an exceptionally long week,

I have sent to Minister and look forward to seeing Barry/Dan, Peter Borrows and Bob Reilly at 9 am in Minister Robertson's office,

thanks
John B

From: Elaina Smouha [mailto:elainamir[redacted]
Sent: Sunday, 16 January 2011 10:14 PM
To: Bradley John
Cc: Dennien Barry[redacted]; spiller daniel[redacted]; WaterGridMedia; Best Debbie; pborrows
Subject: Cabinet in confidence - Ministerial brief - Flood event and Wivenhoe Dam

John

Attached is the Ministerial Brief and accompanying attachments for the Emergency Cabinet meeting scheduled on 17 January 2011.

Regards

Elaina

Elaina Smouha
Director, Governance and Regulatory Compliance
SEQ Water Grid Manager
[redacted]
Email: elaina.smouha[redacted]
Visit: Level 15, 53 Albert Street Brisbane
Post: PO Box 16205, City East QLD 4002
ABN: 14783 317 630

From:	Barry Dennien </O=SOUTH EAST QUEENSLAND WATER GRID MANAGER/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BARRY.DENNIEN>
Sent:	Tuesday, January 25, 2011 4:32 PM
To:	john.bradley[redacted]
Cc:	Dan Spiller <Daniel.Spiller[redacted] elaina.smouha[redacted] pborrows[redacted] Reilly Bob <Bob.Reilly[redacted]
Subject:	Public inquiry discussion points - brief - Cabinet in confidence
Attach:	Public inquiry strategy - brief.docx

John

Attached are some discussion points in preparation for the 2pm teleconference about Monday's Emergency Cabinet meeting.

Regards

Barry

1201DO

Discussion points for teleconference

What is the objective?

a) Ensuring public transparency
b) To answer the State's questions on the performance of Wivenhoe Dam operations
c) Preparation for a public inquiry
d) Normal and logical course of conduct after the occurrence of a major flood event – Review requirement under the Flood Mitigation Manual

Background

1) Design of Dam – Storages/Spillway upgrade (Responsible: Seqwater)
2) How does Wivenhoe Dam work as a flood mitigator? Stats on how much did Wivenhoe Dam knock off the flood peak? **[Priority to get out to the public]** *(Responsible: Seqwater)*
3) Development of Flood Mitigation Manual (*Responsible: Seqwater/DERM*)
    a. Four strategies
    b. History of Flood Mitigation Manual updates and peer review
4) Responsibility under the *Water Supply (Safety and Reliability) Act 2008* (*Responsible: DERM*)
    a. What is the formal reporting process following a major flood event?
5) "The Event" – operation of Wivenhoe Dam (*Responsible: Seqwater*)
    a. Event report under the Flood Mitigation Manual
6) "The Event" – management of the Water Grid emergency under the SEQ Water Grid Emergency Response Plan (*Responsible: SEQ Water Grid Manager*)
7) What next?
    a. SWOT
        i. Community feedback
        ii. A significant (from a national perspective)

Seqwater report

Flood Mitigation Manual requires a report to the Chief Executive after a significant flood event, on the effectiveness of the operational procedures:

- Get more comprehensive report from Brian Cooper? – review appropriateness of trigger levels – take into account the accuracy of rainfall forecasts provided by BOM at the time – reliability of weather forecasts.
- Set up expert panel for Flood Mitigation Manual review
- Communication Protocol and incorporation into the Flood Mitigation Manual (revisit in the next fortnight)

Seqwater to procure review.

Urgent accelerated review due to anticipated further rainfall.

1201 DP

From: Dan Spiller <dan.spiller[redacted]
Sent: Monday, March 7, 2011 6:19 PM
To: 'Bradley John' <John.Bradley[redacted]>;
'Debbie.Best[redacted]'; 'Reilly Bob' <Bob.Reilly[redacted]>
Cc: Barry Dennien <Barry.Dennien[redacted]>
Subject: Summary report
Attach: January flood event_Summary of information released_FINAL.PDF

All,

Report as provided to Stark and CM.

Dan

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

SEQ Water Grid

January 2011 flood event
Summary of dam operations

January 2011

safe secure sustainable

G149

1.0 Introduction

A flood event occurred in South East Queensland in January 2011.

Throughout this event, the Water Grid provided regular updates on the levels of key storages and the management of releases. The releases were provided to media outlets and Councils, and made available on the Water Grid website (www.watergrid.com.au). The updates released during the flood event have been collated under **Attachment 1**.

Updates focused on the four dams in South East Queensland that are gated, with the ability to control the rate of release of floodwater. These are Wivenhoe, Somerset, North Pine and Leslie Harrison dams.

The updates include information about the storage levels of each dam and releases from those dams. They also contain most general information about:

- flows from the Lockyer and Bremer, which enter the Brisbane River downstream of Wivenhoe Dam
- impacts on downstream bridges, based on advice from the Councils that own those bridges
- rainfall forecasts, based on advice from the Bureau of Meteorology.

Information about the regulatory framework for the management of Wivenhoe and Somerset dams is contained in Section 2.

Information about the operation of Wivenhoe and Somerset dams is summarised in Section 3.

Information about the operation of North Pine and Leslie Harrison dams is summarised in Section 4. Information on Hinze Dam releases are also included.

All of these dams are owned and operated by Seqwater. The information provided in the updates was based on information provided by Seqwater.

As outlined in Section 5, more detailed information about the impact of dam releases on river levels is being prepared by the Bureau of Meteorology and responsible Councils.

2.0 Regulatory framework

Detailed operational procedures have been approved for each of the gated dams.

Seqwater is the owner and operator of Wivenhoe and Somerset Dams.

Under Section 370 of the *Water Supply (Safety and Reliability) Act 2008*, it is required to prepare a flood mitigation manual for approval by the Dam Safety Regulator.

Seqwater's approved *Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam* (Operations Manual) can be viewed at www.derm.qld.gov.au. At the request of Seqwater, some sections of the published version Operations Manual have been deducted for security reasons relating to critical infrastructure.

The Operations Manual sets out clear priorities for the strategies to manage water supplies in the dams.

The Operations Manual lists the structural safety of the dam as the highest priority, particularly in extreme weather events where there is the threat of the dam over-topping which could lead to damage to the dam wall.

With the structural safety of the dam secure, the next objectives in order of priority are to provide optimum protection of urbanised areas from inundation, minimise disruption to rural life in the valley of the Brisbane and Stanley Rivers, provide full water supply storage after the flood, and minimise impacts to riparian flora and fauna during the drain down phase of the flood event.

The operational procedures outlined in the Operations Manual have been developed and progressively refined over many years, and have been reviewed by Australia's leading water experts.

They include Professor Colin Apelt, Head of Department, Department of Civil Engineering and Chair of the Brisbane City Council flood taskforce; University of Queensland and Mr Eric Lesleighter, Principal Hydraulic Engineer and Chief Engineer Water Resources, Snowy Mountains Engineering Corporation.
The Operations Manual in its current form was developed in 1992 and has had six revisions since this time, with the latest review taking place in 2009, and finalised in January 2010.

More general information about the operation of Wivenhoe Dam is contained in a factsheet at **Attachment 2.**

3.0 Wivenhoe and Somerset dams

Table 1 summarises the information released during the event, including the dam levels and release rates. For some days, dam levels are not specified. For those days, levels were not specified in the releases or updated on the Seqwater website.

On 13 February 2010, Seqwater announced that Wivenhoe Dam would be reduced to 75 per cent of its full supply level. This is an interim measure for the remainder of the summer, with the longer term approach to be shaped by the Commission of Inquiry's outcomes. Seqwater advises that a reduction in Wivenhoe Dam storage level to 75 per cent of its Full Supply Level will provide appreciable flood mitigation benefits ahead of any major rain events in the remainder of the wet season.

The operational decision reflects current circumstances, rather than issues which likely to be considered by the Commission of Inquiry into the recent floods. The Commission of Inquiry will continue to assess dam operations during the January flood event and whether any changes to the long term framework are required.

Table 1: Wivenhoe and Somerset dam operation

Update	Wivenhoe Dam		Somerset Dam		Bridges Inundated							Key statements from updates
	Level	Releases	Level	Releases into Wivenhoe Dam	Twin	Savages	Burtons	Kholo	Colleges	Fernvale	Mt Crosby	
Saturday 1 January	-	130,000 ML/day	-	Through regulator valve	x	x	x	x	x			• The gradual gate closure sequence at Wivenhoe began overnight and by sometime Sunday all gates will be closed.
Sunday 2 January	-	All five gates closed Sunday morning	-	Through regulator valve	x	x						• All five gates were fully closed this morning.
Monday 3 January	-	-	-	-	x							• No update
Tuesday 4 January	102%	Through regulator valve	103%	Through regulator valve								• No update
Wednesday 5 January	102%	Through regulator valve	103%	Through regulator valve								• No update
Thursday 6 January	103%	Through regulator valve. Gate operations will be required	104%	Through regulator valve	x	x	x	x	x			• Gate operations at Wivenhoe Dam will be required. To minimise downstream impacts, these releases will commence when flood levels in the lower Lockyer Creek subside. • Local flows, and the expected Wivenhoe Dam release, may impact upon Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing for several days.
Friday 7 January	106%	Through regulator valve. Gate operations will be required at 130,000 ML/day	107%	Through regulator valve	x	x	x	x	x			• To minimise downstream impacts, these releases will commence when flood levels in the lower Lockyer Creek subside. The rate of release will be similar to last week, at up to 130,000 megalitres per day.
Saturday 8 January	-	100,00 ML/day through all 5 gates	-	Through one gate	x	x	x	x	x			• Releases will be reviewed and may change depending on rainfall, inflows into the dam and river flows.
Sunday 9 January	-	116,000 ML/day	-	Through sluice gates	x	x	x	x	x			• Gate operations will continue to be reviewed and may change at short notice depending on rainfall, inflows into the dam and river flows. • These releases are expected to continue until next week.

Update	Wivenhoe Dam		Somerset Dam		Bridges inundated							Key statements from updates
	Level	Releases	Level	Releases into Wivenhoe Dam	Twin	Savages	Burtons	Kholo	Colleges	Fernvale	Mt Crosby	
Monday 10 January (Morning)	140%	170,000 ML/day	150%	Through sluice gates	x	x	x	x	x	x	x	• 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.
Monday 10 January (Evening)	154%	Increasing to 240,000 ML/day	158%	Through sluice gates	x	x	x	x	x	x	x	• 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.
Tuesday 11 January (Morning)	173%	Further increases today	160%	Through sluice gates	x	x	x	x	x	x	x	• Significant rainfall received across catchments has caused waterways upstream of Somerset and Wivenhoe Dams to rise quickly overnight. • Controlled releases through the five gates have been

Update	Wivenhoe Dam		Somerset Dam		Bridges inundated							Key statements from updates
	Level	Releases	Level	Releases into Wivenhoe Dam	Twin	Savages	Burtons	Kholo	Colleges	Fernvale	Mt Crosby	
												held at around 236,000 megalitres since early last night but will need to be increased further today.
Tuesday 11 January (Evening 5.19PM)	190%	490,000 ML/day	176%	176,000 ML/day through sluice gates	x	x	x	x	x	x	x	• Controlled releases through Wivenhoe's five radial gates have now been increased to around 490,000 megalitres per day. This is expected to increase. • While substantial amounts of water are 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.
Tuesday 11 January (Evening 10.30PM)	190%	645,000 ML/day	183%	Releases ceased, but expected to recommence overnight	x	x	x	x	x	x	x	• 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. • 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.
Wednesday 12 January (Morning)	190%	205,000 ML/day, down from an overnight peak of 645,000 ML/day	190%	Through sluice gates	x	x	x	x	x	x	x	• Wivenhoe's five radial gates are currently releasing 205,000 megalitres per day, down from 370,000 megalitres and an overnight peak of 645,000 megalitres. • This strategy is to allow for the Bremer and Lockyer Rivers to subside. • After the expected downstream peak in the lower Brisbane River has passed, releases will need to be increased to 301,000 megalitres per day. • However, this increase is unlikely to cause a second significant rise in the river.

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Update	Wivenhoe Dam		Somerset Dam		Bridges Inundated							Key statements from updates
	Level	Releases	Level	Releases into Wivenhoe Dam	Twin	Savages	Burtons	Kholo	Colleges	Fernvale	Mt Crosby	
Wednesday 12 January (Evening)	189%	215,000 ML/day	186%	123,000 ML/day	x	x	x	x	x	x	x	• These controlled releases must continue in order to relieve Wivenhoe Dam's swollen flood storage compartment in order to create space for further rainfall and inflows. • Wivenhoe's five radial gates continue to release 215,000 megalitres per day. This is considerably down from an overnight peak of 645,000 megalitres and will remain at this level to allow for the Bremer and Lockyer Rivers to subside. • After the expected downstream peak in the lower Brisbane River has passed, releases will be increased to 301,000 megalitres per day, however, this increase is unlikely to cause a second significant rise in the river.
Thursday 13 January (Morning)	187%	215,000 ML/day	174%	121,000 ML/day	x	x	x	x	x	x	x	• Wivenhoe Dam is at 187 per cent, and is dropping gradually with controlled releases through all five gates of 215,000 megalitres per day. • The dam's slow recession is due in part to inflows of 121,000 megalitres per day via a sluice gate from Somerset Dam. Somerset is at 174 per cent.
Thursday 13 January (Evening)	186%	228,000 ML/day	167%	120,000 ML/day	x	x	x	x	x	x	x	• Wivenhoe Dam is at 186 per cent, and is dropping gradually with controlled releases through all five gates of 228,000 megalitres per day.
Friday 14 January (Morning)	179%	301,000 ML/day	151%	111,800 ML/day	x	x	x	x	x	x	x	• Wivenhoe Dam is at 179 per cent, and continues to drop steadily. Releases have been graduated to 301,000 megalitres per day in a 7 day strategy designed to draw down the flood storage compartment with no noticeable effects downstream. • The continuing releases are necessary in order to prepare Wivenhoe for any future weather events

Update	Wivenhoe Dam		Somerset Dam		Bridges inundated							Key statements from updates
	Level	Releases	Level	Releases into Wivenhoe Dam	Twin	Savages	Burtons	Kholo	Colleges	Fernvale	Mt Crosby	
												should they occur.
Friday 14 January (Evening)	172%	301,000 ML/day	140%	111,800 ML/day	x	x	x	x	x	x	x	• Wivenhoe Dam is at 172 per cent, and continues to drop steadily. • Inflows and water levels in the Brisbane and Pine catchments are being continually monitored.
Saturday 15 January (Morning)	163%	301,000 ML/day	129%	79,000 ML/day	x	x	x	x	x	x	x	• Wivenhoe Dam is at 163 per cent, and continues to drop steadily.
Saturday 15 January (Evening)	154%	301,000 ML/day	121%	79,000 ML/day	x	x	x	x	x	x	x	• Wivenhoe Dam is at 154 per cent, and continues to drop steadily.
Sunday 16 January	138%	299,000 ML/day	106%	70,500 ML/day	x	x	x	x	x	x	x	• Wivenhoe Dam is at 138 per cent, and continues to drop steadily. Releases continue at around 299,000 megalitres per day. This flow will be maintained to drain the flood storage compartment this week.
Monday 17 January	123%	299,000 ML/day	100%	Small discharges	x	x	x	x	x	x	x	• Wivenhoe Dam is at 123 per cent capacity and continues to drop steadily. Releases continue at around 299,000 megalitres per day. • Somerset Dam is at 100 per cent with small discharges through the cone valves into Wivenhoe.
Tuesday 18 January	107%	176,000 ML/day and reducing with the gate closing sequence	99%	Small discharges	x	x	x	x	x	x	x	• 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.
Wednesday 19 January	99%	Gate closing sequence expected to be completed by Thursday	100%	Sluice gates closed	x	x	x	x	x	x	x	• Wivenhoe Dam is at 99.3 per cent with the gate closing sequence expected to be complete by late afternoon today.

Update	Wivenhoe Dam		Somerset Dam		Bridges Inundated							Key statements from updates
	Level	Releases	Level	Releases into Wivenhoe Dam	Twin	Savages	Burtons	Kholo	Colleges	Fernvale	Mt Crosby	
Thursday 20 January	99.6%	One gate partially open	100.8%	Sluice gates closed	x							• 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. • Last night's storms over the catchment have resulted in one gate being partially opened at Wivenhoe Dam this morning. This will see a small controlled release over the course of today to maintain the dam at or near 100%.

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4.0 Other dams

Controlled releases were made from North Pine, Leslie Harrison and Hinze dams. These releases are summarised in **Table 2**.

Table 2: Other dam operation

Update	North Pine		Hinze		Leslie Harrison	
	Dam level	Releases	Dam level	Releases	Dam level	Releases
Thursday 30 December	99.9%	-	100.0%	Minor releases	97.6%	-
Friday 31 December	100.2%	-	100.0%	Minor releases	97.8%	-
Saturday 1 January	-	Minor releases underway	-	Minor releases	-	-
Sunday 2 January	-	Minor release overnight, gates closed early morning	-	Minor releases	-	-
Monday 3 January	-	-	-	-	-	-
Tuesday 4 January	99.0%	-	99.6%	-	98.8%	-
Wednesday 5 January	99.1%	-	99.6%	-	98.8%	-
Thursday 6 January	100.0%	Releases expected today	99.9%	-	98.8%	Releases commenced
Friday 7 January	-	Spillway operations commenced	100.0%	-	96.2%	Releases underway
Saturday 8 January	-	Minor releases underway	-	Releases predicted	-	Releases underway
Sunday 9 January	-	Release operations being reviewed	-	Minor releases underway	-	Releases ceased
Monday 10 January am	103.9%	5 gates open releasing 43,000 ML/day	100.0%	Minor releases 1,200 ML/day	100.0%	Releases underway
Tuesday 11 January am	105.3%	5 gates open releasing 15,000 ML/day	100.0%	Minor releases 1,200 ML/day	96.8%	Releases underway
Wednesday 12 January am	101.8%	5 gates open, releasing 6,800 ML/day	112.1%	Minor releases 8,000 ML/day	96.1%	Releases underway
Thursday 13 January am	100.4%	5 gates open. Expected to close Friday	-	Minor releases 8,000 ML/day	96.9%	Releases ceased
Friday 14 January am	-	Releases ceased	100.0%	Minor releases 8,000 ML/day	97.3%	-
Saturday 15 January am	-	-	-	Minor releases 8,000 ML/day	-	-
Sunday 16 January	96.0%	-	-	Minor releases 6,800 ML/day	-	-
Monday 17 January	99.4%	-	99.8%	Minor releases 6,800 ML/day	97.7%	-

5.0 Additional information

A range of modelling is required to be undertaken to ascertain the precise downstream impact of releases from Wivenhoe Dam during the January 2011 flood event.

Compiling this technical information requires the following tasks:

- validation the water outflows from Wivenhoe Dam
- calculation and validation Brisbane River levels as a result of the water outflows
- determination of the impact of inundation based on those Brisbane River levels.

Seqwater has responsibility for providing and validating water outflows over the event.

Both the Bureau of Meteorology and the Brisbane City Council have developed models for determining Brisbane River levels for various water outflows from Wivenhoe Dam. This includes taking into account flows down both the Lockyer and Bremer rivers and other localised flows. Brisbane City Council has developed the modelling to determine the impact of Brisbane River levels on the flooding properties and households.

Seqwater dam levels and water outflows during the January event are required to be validated and provided to the Dam Safety Regulator as part of a comprehensive report into the event. This report will also be provided to the Commission of Inquiry into the Queensland floods which is now underway.

In addition, Bureau of Meteorology has agreed to be the clearing house for all data requests in relation to either river or rainfall gauges across the region in relation to the January flood event. Any request for this data should be directed to climate.qld [redacted].

Attachment 1: Update

TRIM reference: D/	Date and time: 1/01/11 10:45am
Title : MEDIA UPDATE - 01.01.11	
Summary: Dam safety for South East Queensland over holiday season, Most recreation facilities open	
Note: Issued to all key media and stakeholders in South East Queensland	

MEDIA UPDATE
1 January 2011

Dam safety for South East Queensland over holiday season

Controlled floodwater releases over several days will see Wivenhoe Dam return to full supply level this weekend.

With the flood compartment empty, Wivenhoe Dam will be ready for more rain forecast next week.

Over the last week, Wivenhoe Dam's flood storage compartment has significantly reduced the flood risk for Brisbane and Ipswich.

The gradual gate closure sequence at Wivenhoe began overnight and by sometime Sunday all gates will be closed.

Water Grid operators continue to work closely with councils regarding dam releases and Twin Bridges, Savages Crossing, Colleges Crossing, Kholo and Burton Bridges will continue to be inundated until Sunday.

Somerset Dam continues to make minor releases into Wivenhoe.

A minor release is being made from North Pine Dam however no impact on Youngs Crossing is expected.

No releases are currently being made from Leslie Harrison Dam

Hinze Dam continues to discharge flood waters and this is expected to continue until early next week. There is no public access to the spillway.

For information on local flood impacts, including road closures, members of the public should always contact the local council.

For recorded information on current dam releases in South east Queensland, call [redacted].

Most recreation facilities open

Lower dam levels mean that both Somerset and Wivenhoe Dams are now open to water based activities.

All recreation sites are now open, except for:

- River access at Atkinson's Crossing
- Billies Bay/Hay's Landing

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: [redacted] **| Email:** media[redacted]

TRIM reference: D/	Date and time: 2/01/11 9:50am
Title : MEDIA UPDATE - 02.01.11	
Summary: Dam safety for South East Queensland over holiday season, Most recreation facilities open	
Note: Issued to all key media and stakeholders in South East Queensland	

MEDIA UPDATE
2 January 2011

Dam safety for South East Queensland over holiday season

All five gates at Wivenhoe Dam were fully closed on Sunday morning.

This means the flood compartment at Wivenhoe Dam is ready for more rain forecast next week.

Councils have been advised and they will make decisions about opening Twin Bridges, Savages Crossing, Colleges Crossing, Kholo and Burton Bridges as inundation levels drop.

Somerset Dam continues to make minor releases into Wivenhoe.

A minor release was made overnight at North Pine Dam with gates closed early Sunday morning.

No releases are being made from Leslie Harrison Dam

Flood water releases from Hinze Dam will reduce during today and the gate is expected to close sometime tomorrow. There is no public access to the spillway.

For information on local flood impacts, including road closures, members of the public should always contact the local council.

For recorded information on current dam releases in South East Queensland, call [redacted]

Most recreation facilities open

Both Somerset and Wivenhoe Dams are open to water based activities.

All recreation sites are now open, except for:
- River access at Atkinson's Crossing
- Billies Bay/Hay's Landing

which are both expected to re-open sometime today.

Due to the ground being saturated, care should be taken around all recreation sites. Vehicles must only be parked in designated parking areas and should not be driven on off roads or onto grassed areas.

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.

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For further details contact the SEQ Water Grid Communications Unit on:
Ph: [redacted] **| Email:** media[redacted]

TRIM reference: D/	Date and time: 6/01/11 4:13pm
Title : SEQ dam release and flooding update - 06.01.11	
Summary: Dam releases, Recreation update, Gold Coast Desalination Plant update	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 06.01.11

MEDIA RELEASE - 6 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.

Gate operations at Wivenhoe Dam will be required. To minimise downstream impacts, these releases will commence when flood levels in the lower Lockyer Creek subside.

Local flows, and the expected Wivenhoe Dam release, 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.

Water from Somerset Dam is being released into Wivenhoe Dam through a regulator valve, which may increase later today.

A release through the gate at North Pine Dam is expected to commence later today.

A release from Leslie Harrison is underway and may continue until the weekend.

No water is currently being released from 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.

Recreation update

Dams are currently open for water-based recreational activities, however this may change depending on the weather. Visitors should check the Water Grid website 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 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.

PLEASE NOTE: 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 -** [redacted]. 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 detailed information on **potential impacts in their local areas including road closures should direct inquiries to their local councils**.

For further details contact the Water Grid Communications Unit on:
Ph: [redacted] | Email: media[redacted]

TRIM reference: D/	Date and time: 7/01/11 10:03am
Title : SEQ dam release and flooding update - 07.01.11	
Summary: Dam releases, Recreation update, Gold Coast Desalination Plant update	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 07.01.11

MEDIA RELEASE - 7 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.

Water from Somerset Dam is being released into Wivenhoe Dam through a regulator valve. The releases may be increased to utilise sluice gates later today or over the weekend.

Gate operations at Wivenhoe Dam will be required. To minimise downstream impacts, these releases will commence when flood levels in the lower Lockyer Creek subside. The rate of release will be similar to last week, at up to 130,000 megalitres per day.

Local flows, and the expected Wivenhoe Dam release, 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.

Spillway gate operations commenced yesterday evening at North Pine Dam. These releases may continue until next week, depending upon further rainfall.

A release from Leslie Harrison is underway and may continue until the weekend.

No water is currently being released from 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.

Telephone - [redacted] 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 is **closed** to all water based recreational activities as of this morning. The closure will most likely extend over the weekend.

At this stage Lake Somerset is open to all water based recreational activities, however this may change with short notice.

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.

Moogerah and Maroon Dam remains open, but swimming and skiing should be avoiding.

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

Visitors should check the Water Grid website 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.

PLEASE NOTE: While releases are being made from the region's water storages, routine updates will be provided.

For further details contact the Water Grid Communications Unit on:
Ph: [redacted] | Email: media[redacted]

TRIM reference: D/	Date and time: 7/01/11 4:42pm
Title : SEQ dam release and flooding update - 07.01.11	
Summary: Friday Grid Update, Dam releases	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 07.01.11

WEEKLY GRID UPDATE
FRIDAY 7 JANUARY 2011

DAM RELEASES

Gate operations have commenced at Wivenhoe Dam and releases are expected to reach around 100,000 megalitres a day by tomorrow afternoon. Releases will be reviewed and may change depending on rainfall, inflows into the dam and river flows.

Twin Bridges, Savages Crossing, Burtons Bridge, Kholo Bridge and Colleges Crossing may be inundated 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.

Water from Somerset Dam is being released into Wivenhoe Dam through a regulator valve. The releases may increase to utilise sluice gates later today or over the weekend to manage rainfall and inflows.

Spillway gate operations commenced yesterday evening at North Pine Dam. These releases may continue into next week, depending upon further rainfall. The local council has been advised that Youngs Crossing Road may be inundated.

A release from Leslie Harrison Dam is underway and may continue until next week.

A release through the emergency gates at Hinze Dam is expected during the weekend.

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.

Telephone - [redacted] 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 high water levels, Lake Wivenhoe is currently closed to all water based recreational activities. The closure will most likely extend over the next few days.

The following recreation sites at Wivenhoe 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 and Hays Landing

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.

Lake Somerset will be temporarily closed to all water based recreational activities from 6pm tonight and is expected to remain closed over the weekend and possibly into next week.

Access to Lake Borumba is not available as Yabba Creek Road between Imbil and Borumba Dam is currently closed. Access is expected to remain closed for several days.

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 on 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.

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	72mm
Somerset	**100%**	No change	74mm
North Pine	**98.4%**	1.8% ↓	82mm
Hinze	**100%**	No change	72mm
Baroon Pocket	**100%**	No change	95mm
Leslie Harrison	**96.2%**	1.6% ↓	121mm
Ewen Maddock	**100%**	No change	105mm
Cooloolabin	**100%**	No change	92mm
Lake Kurwongbah	**100%**	No change	82mm
Lake MacDonald	**100%**	No change	90mm
Little Nerang	**100%**	No change	72mm
Wappa	**100%**	No change	92mm

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?

By maintaining the Gold Coast Desalination Plant in standby mode, the Water Grid can ensure that the plant is online and available at any stage. This ensures water quality issues can be addressed without compromising water security for the South East Queensland region. The flexibility of the Water Grid allows us to safely isolate, transfer and blend water from multiple sources across the region.

Notes 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 -** [redacted]. 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 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.

CONTACT DETAILS

Please direct all media enquiries to the Water Grid Communications Unit:

Phone [redacted]
Email: media[redacted]
Website: www.watergrid.com.au

TRIM reference: D/	Date and time: 8/01/11 10:26am
Title : SEQ dam release and flooding update - 08.01.11	
Summary: Dam releases, Recreation update, Gold Coast Desalination Plant update	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 08.01.11

MEDIA RELEASE - 8 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.

Water from Somerset Dam is being released into Wivenhoe Dam through one gate.

At Wivenhoe Dam, all five gates are now open. Releases are expected to reach around 100,000 megalitres a day by this afternoon. Releases will be reviewed and may change 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.

Spillway gate operations commenced during the evening of Thursday 6 January 2011. These releases may continue until next week, depending upon further rainfall.

A release from Leslie Harrison is underway and may continue until the weekend.

Releases through the emergency gates of Hinze Dam is expected to occur sometime over the weekend.

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.

Telephone - [redacted] 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 for some days.

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 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.

PLEASE NOTE: 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 -** [redacted]. 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 detailed information on **potential impacts in their local areas including road closures should direct inquiries to their local councils**.

For further details contact the Water Grid Communications Unit on:
Ph: [redacted] | Email: media[redacted]

TRIM reference: D/	Date and time: 9/01/11 9:29am
Title : SEQ dam release and flooding update - 9.01.11	
Summary: Dam releases, Recreation update, Gold Coast Desalination Plant update	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 09.01.11

MEDIA RELEASE - 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.

Telephone - [redacted] 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 for additional information for each recreation site.

Gold Coast Desalination Plant

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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.

PLEASE NOTE: 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 -** [redacted]. 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 detailed information on **potential impacts in their local areas including road closures should direct inquiries to their local councils.**

For further details contact the Water Grid Communications Unit on:
Ph: [redacted] | Email: **media**[redacted]

TRIM reference: D/	Date and time: 10/01/11 7:15am
Title : SEQ dam release and flooding update - 10.01.11 AM	
Summary: Wivenhoe Dam releases	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 10.01.11 AM

MEDIA RELEASE - 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 - [redacted] 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 -** [redacted]. 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.

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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[redacted]

TRIM reference: D/	Date and time: 10/01/11 10:42am
Title : SEQ dam release and flooding update - 10.01.11 AM	
Summary: Dam releases, Recreation update, Gold Coast Desalination Plant update	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 10.01.11 AM

MEDIA RELEASE - 10 JANUARY 2011

Dam releases

Significant rainfall across the catchment 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, and 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.

Telephone - [redacted] 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 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.

SEQ Water Grid

Media updates issued during the January flood event

PLEASE NOTE: 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 -** [redacted]. 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 detailed information on **potential impacts in their local areas including road closures should direct inquiries to their local councils.**

For further details contact the Water Grid Communications Unit on:
Ph: [redacted] | Email: **media**[redacted]

TRIM reference: D/	Date and time: 10/01/11 4:50pm
Title : SEQ dam release and flooding update - 10.01.11 PM	
Summary: Dam releases, Recreation update, Gold Coast Desalination Plant update	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 10.01.11 PM

MEDIA RELEASE - 10 JANUARY 2011

Dam releases

Significant rainfall in 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.

Telephone - [redacted] 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 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.

PLEASE NOTE: 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 -** [redacted]. 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 detailed information on **potential impacts in their local areas including road closures should direct inquiries to their local councils.**

For further details contact the Water Grid Communications Unit on:
Ph: [redacted] | Email: **media**[redacted]

TRIM reference: D/	Date and time: 11/01/11 8:39am
Title : SEQ dam release and flooding update - 11.01.11 AM	
Summary: Unprecedented Wivenhoe Dam releases, Residents urged to conserve water supply, Upper Somerset townships urged to conserve water	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 11.01.11 AM

MEDIA RELEASE - 11 JANUARY 2011

UNPRECEDENTED WIVENHOE DAM RELEASES

NOTE: All SEQ dams are safe, stable and operating within their design specifications.

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.

Telephone - [redacted] has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking detailed information on **potential impacts in their local areas including road closures should direct inquiries to their local councils**.

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 [redacted], **or for emergencies please call** [redacted].

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.

PLEASE NOTE: 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 -** [redacted]. 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 detailed information on **potential impacts in their local areas including road closures should direct inquiries to their local councils.**

For further details contact the Water Grid Communications Unit on:
Ph: [redacted] | Email: media[redacted]

TRIM reference: D/	Date and time: 11/01/11 5:19pm
Title : SEQ dam release and flooding update - 11.01.11 PM	
Summary: Increased controlled releases from Wivenhoe	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 11.01.11 PM

MEDIA RELEASE - 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 -** [redacted]. 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[redacted]

TRIM reference: D/	Date and time: 11/01/11 10:30pm
Title : SEQ dam release and flooding update - 11.01.11 PM	
Summary: Controlled releases from Wivenhoe Dam decreasing	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 11.01.11 PM

MEDIA RELEASE - 11 JANUARY 2011

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: [redacted] | **Email:** media[redacted]

TRIM reference: D/	Date and time: 12/01/11 8:39am
Title : SEQ dam release and flooding update - 12.01.11 AM	
Summary: Controlled releases from Wivenhoe Dam decreasing	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 12.01.11 AM

MEDIA RELEASE - 12 JANUARY 2011

CONTROLLED RELEASES FROM WIVENHOE DAM DECREASING

NOTE: All SEQ dams are safe, stable and operating within their design specifications.

Currently, Wivenhoe Dam is at 190 per cent down from 191 per cent overnight.

This reflects the current ease in the weather. Somerset Dam is now at 190 per cent.

Wivenhoe's five radial gates are currently releasing 205,000 megalitres per day, down from 370,000 megalitres and an overnight peak of 645,000 megalitres.

This strategy is to allow for the Bremer and Lockyer Rivers to subside.

After the expected downstream peak in the lower Brisbane River has passed, releases will need to be increased to 301,000 megalitres per day.

However, this increase is unlikely to cause a second significant rise in the river.

These controlled releases must continue in order to relieve Wivenhoe Dam's swollen flood storage compartment in order to create space for further rainfall and inflows.

They 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.

Telephone - [redacted] has been established for members of the public seeking information on which dams are spilling in South East Queensland.

Members of the public seeking detailed information on **potential impacts in their local areas including road closures should direct inquiries to their local councils**.

PLEASE NOTE: 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 -** [redacted]. 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 detailed information on **potential impacts in their local areas including road closures should direct inquiries to their local councils**.

For further details contact the Water Grid Communications Unit on:
Ph: [redacted] | Email: media[redacted]

TRIM reference: D/	Date and time: 12/01/11 12:47pm
Title : SEQ dam release and flooding update - 12.01.11 PM	
Summary: Controlled releases from Wivenhoe Dam are continuing	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 12.01.11 PM

MEDIA RELEASE - 12 JANUARY 2011

CONTROLLED RELEASES FROM WIVENHOE DAM ARE CONTINUING

NOTE: All SEQ dams remain safe, stable and operating within their design specifications.

Currently, Wivenhoe Dam is at 189 per cent, down from 191 per cent overnight. This reflects the current ease in the weather. Somerset Dam is now at 186 per cent, discharging 123,000 megalitres per day into Wivenhoe Dam via a sluice gate.

Wivenhoe's five radial gates continue to release 215,000 megalitres per day. This is considerably down from an overnight peak of 645,000 megalitres and will remain at this level to allow for the Bremer and Lockyer Rivers to subside.

After the expected downstream peak in the lower Brisbane River has passed, releases will be increased to 301,000 megalitres per day, however, this increase is unlikely to cause a second significant rise in the river.

These controlled releases must continue in order to relieve Wivenhoe Dam's swollen flood storage compartment in order to create space for further rainfall and inflows, should they occur.

They 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 releasing 6,800 megalitres per day, however with no further rainfall, the gates are expected to close in the next coming days. 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 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.

Telephone - [redacted] has been established for members of the public seeking information on which dams are spilling in South East Queensland.

For detailed information on river levels, road and crossing closures and other potential impacts, always contact your local council.

ENDS

Owing to technical issues caused by the flood, a temporary email contact is in use. Please email to **watergridmedia**[redacted]

PLEASE NOTE: 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 -** [redacted]. 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.**

For further details contact the Water Grid Communications Unit on:
[redacted]
| Email: watergridmedia[redacted]

TRIM reference: D/	Date and time: 13/01/11 8:30am
Title : SEQ dam release and flooding update - 13.01.11 AM	
Summary: Controlled releases from Wivenhoe Dam continue	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 13.01.11 AM

MEDIA RELEASE - 13 JANUARY 2011

CONTROLLED RELEASES FROM WIVENHOE DAM CONTINUE

NOTE: All SEQ dams remain safe, stable and operating within their design specifications.

Wivenhoe Dam is at 187 per cent, and is dropping gradually with controlled releases through all five gates of 215,000 megalitres per day. This is down from the peak of 645,000 megalitres earlier in the week.

The dam's slow recession is due in part to inflows of 121,000 megalitres per day via a sluice gate from Somerset Dam. Somerset is at 174 per cent.

After the expected downstream peak in the lower Brisbane River has passed, releases will be increased to 301,000 megalitres per day.

This increase is unlikely to cause a second significant rise in the river and is necessary in order to relieve Wivenhoe Dam's swollen flood storage compartment in order to create space for further rainfall and inflows, should they occur.

All 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 are expected to close Friday. The local Council is being kept informed regarding Youngs Crossing.

Gate releases at Leslie Harrison Dam have now ceased.

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

Owing to technical issues caused by the flood, a temporary email contact is in use. Please email to **watergridmedia**[redacted]

PLEASE NOTE: 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 -** [redacted]. 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.**

For further details contact the Water Grid Communications Unit on:
Ph: [redacted] **| Email:**
watergridmedia[redacted]

TRIM reference: D/	Date and time: 13/01/11 5:30pm
Title : SEQ dam release and flooding update - 13.01.11 PM	
Summary: Controlled releases from Wivenhoe Dam continue	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 13.01.11 PM

MEDIA RELEASE - 13 JANUARY 2011

CONTROLLED RELEASES FROM WIVENHOE DAM CONTINUE

NOTE: All SEQ dams remain safe, stable and operating within their design specifications.

Wivenhoe Dam is at 186 per cent, and is dropping gradually with controlled releases through all five gates of 228,000 megalitres per day. This is down from the peak of 645,000 megalitres earlier in the week.

The dam's slow recession is due in part to inflows of 120,000 megalitres per day via a sluice gate from Somerset Dam. Somerset is at 167 per cent.

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, are expected to close Friday. The local Council is being kept informed regarding Youngs Crossing.

Gate releases at Leslie Harrison Dam have now ceased.

Water has spilled from Wyaralong Dam after it exceeded 100 per cent capacity earlier this week.

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

Owing to technical issues caused by the flood, a temporary email contact is in use. Please email to **watergridmedia**[redacted]

PLEASE NOTE: 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 -** [redacted]. 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.**

For further details contact the Water Grid Communications Unit on:
Ph: [redacted]
| Email: watergridmedia[redacted]

TRIM reference: D/	Date and time: 14/01/11 8:00am
Title : SEQ dam release and flooding update - 14.01.11 AM	
Summary: Controlled releases from Wivenhoe Dam continue	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 14.01.11 AM

MEDIA RELEASE - 14 JANUARY 2011

CONTROLLED RELEASES FROM WIVENHOE DAM CONTINUE

NOTE: All SEQ dams remain safe, stable and operating within their design specifications.

Wivenhoe Dam is at 179 per cent, and continues to drop steadily. Releases have been graduated to 301,000 megalitres per day in a 7 day strategy designed to draw down the flood storage compartment with no noticeable effects downstream.

The continuing releases are necessary in order to prepare Wivenhoe for any future weather events should they occur. Somerset Dam is at 151 percent and also dropping steadily with 111,800 megalitres per day being released into Wivenhoe via the sluice gates.

Inflows and water levels in the Brisbane and Pine catchments are being continually monitored.

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.**

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.

All five gates at North Pine Dam closed this morning.

Gate releases at Leslie Harrison Dam have ceased.

Water has spilled from Wyaralong Dam after it exceeded 100 per cent capacity earlier this week.

A minor release of around 8,000 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 next 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.

ENDS

Owing to technical issues caused by the flood, a temporary email contact is in use. Please email to **watergridmedia**[redacted]

PLEASE NOTE: 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 -**[redacted]. 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.**

For further details contact the Water Grid Communications Unit on:
Ph:[redacted] **| Mobile:**[redacted]
| Email: watergridmedia[redacted]

TRIM reference: D/	Date and time: 14/01/11 4:00pm
Title : SEQ dam release and flooding update - 14.01.11 PM	
Summary: Non-flood affected residents urged to use water wisely	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 14.01.11 PM

MEDIA RELEASE - 14 JANUARY 2011

NON-FLOOD AFFECTED RESIDENTS URGED TO USE WATER WISELY

Despite significant operational challenges caused by flooding, the major water supplies remain reliable in the Water Grid supplying Brisbane, Ipswich and the Gold Coast.

Deputy Premier Paul Lucas said that the region's major water treatment plant at Mount Crosby had been partly flooded and impacted by poor water quality in the Brisbane River.

"While production is increasing, some of our water treatment infrastructure was impacted by floods and the output is still being affected by turbidity in the Brisbane and North Pine Rivers.

"One of Mount Crosby's two water treatment plants, East Bank, was flooded resulting in substantial mechanical damage to large pumps moved by the force of the water.

"Both Mt Crosby plants are now back on line and gradually being brought up to maximum production.

"We are also using the desalination plant and transfers across the Water Grid to resupply local water reservoirs where water levels declined while Mount Crosby was off line."

Mr Lucas urged residents and businesses in Brisbane, Logan and Ipswich who had not been affected by floods to use only what they need for the next few days.

"Our key priority in these areas is maintaining sufficient water for those households and businesses who need to use more in the immediate flood recovery.

"Flood affected residents and businesses will need to use a lot more water than normal, so its important that people who haven't been affected try to use water wisely," he said.

"In suburbs not directly, affected like Wynnum and Manly, we don't need to use a lot of water, so I'd ask every one to do their part in the Queenslander tradition."

Water Grid Manager CEO Barry Dennien said that people who haven't been affected by the flood can help by using the same cautious water use practices that saw us through the drought. These include:

- take only short 4 minute showers
- don't water gardens
- don't hose buildings, driveways and footpaths
- 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 South East Queenslanders showed how well we could conserve water. This latest crisis means residents and businesses outside the directly flooded affected areas need to do the same again" Mr Dennien said.

"I can assure everyone who has not been directly impacted by flooding that by conserving valuable water over the next few days you will make a real and important contribution to the flood recovery effort" said Mr Dennien.

The Water Grid is working closely with local councils to prioritise water use for the cleanup of key roads first, followed by other areas later after water treatment plants are operating normally again.

ENDS

Owing to technical issues caused by the flood, a temporary email contact is in use. Please email to **watergridmedia**[redacted]

PLEASE NOTE: 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 -** [redacted]. 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**.

For further details contact the Water Grid Communications Unit on:
Ph: [redacted]
| Email: watergridmedia[redacted]

TRIM reference: D/	Date and time: 14/01/11 6:00pm
Title : SEQ dam release and flooding update - 14.01.11 PM	
Summary: Controlled releases from Wivenhoe Dam continue	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 14.01.11 PM

MEDIA RELEASE - 14 JANUARY 2011

CONTROLLED RELEASES FROM WIVENHOE DAM CONTINUE

NOTE: All SEQ dams remain safe, stable and operating within their design specifications.

Wivenhoe Dam is at 172 per cent, and continues to drop steadily. Releases have been graduated to 301,000 megalitres per day in a 7 day strategy designed to draw down the flood storage compartment without contributing to further flooding.

The continuing releases are necessary in order to prepare Wivenhoe for any future weather events should they occur.

Somerset Dam is at 140 per cent and also dropping steadily with 111,800 megalitres per day being released into Wivenhoe via the sluice gates. Inflows and water levels in the Brisbane and Pine catchments are being continually monitored.

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 of next 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.

All five gates at North Pine Dam closed this morning.

Gate releases at Leslie Harrison Dam have ceased.

Water has spilled from Wyaralong Dam after it exceeded 100 per cent capacity earlier this week.

A minor release of around 8,000 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 next 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.

ENDS

Owing to technical issues caused by the flood, a temporary email contact is in use. Please email to **watergridmedia**[redacted]

PLEASE NOTE: 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 -** [redacted]. 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.**

For further details contact the Water Grid Communications Unit on:
[redacted]
Email: watergridmedia[redacted]

TRIM reference: D/	Date and time: 15/01/11 9:30am
Title : SEQ dam release and flooding update - 15.01.11 AM	
Summary: Controlled releases from Wivenhoe Dam continue, Water quality	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 15.01.11 AM

MEDIA RELEASE - 15 JANUARY 2011

CONTROLLED RELEASES FROM WIVENHOE DAM CONTINUE

NOTE: All SEQ dams remain safe, stable and operating within their design specifications.

Wivenhoe Dam is at 163 per cent, and continues to drop steadily. Releases continue at around 301,000 megalitres per day as part of a strategy designed to draw down the flood storage compartment by mid-next week without contributing to further flooding.

The continuing releases are necessary in order to prepare Wivenhoe for any future weather events should they occur.

Somerset Dam is at 129 per cent and also dropping slowly with about 79,000 megalitres per day being released into Wivenhoe via the sluice gates.

Inflows and water levels in the Brisbane and Pine catchments are being continually monitored.

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 of next 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.

All five gates at North Pine Dam closed this morning.

Gate releases at Leslie Harrison Dam have ceased.

Water has spilled from Wyaralong Dam after it exceeded 100 per cent earlier this week.

A minor release of around 8,000 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 next 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.

RESIDENTS AND BUSINESSES STRONGLY URGED TO USE WATER WISELY

The connected Water Grid continues to maintain safe and secure water supplies in the face of unprecedented flooding impacts.

Water Treatment Plants across the connected Water Grid are producing at maximum rates however very high demand associated with the clean-up of flood impacts is expected over the weekend.

Given the critical need to ensure adequate water supplies for the clean-up, residents and businesses in areas not directly impacted by flooding are strongly urged to use water wisely.

Within areas affected by flooding, residents should use what water is needed to clean-up immediate flood 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

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**[redacted]

PLEASE NOTE: 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 -** [redacted]. 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**.

For further details contact the Water Grid Communications Unit on:
[redacted]
Email: watergridmedia[redacted]

TRIM reference: D/	Date and time: 15/01/11 6:00pm
Title : SEQ dam release and flooding update - 15.01.11 PM	
Summary: Controlled releases from Wivenhoe Dam continue, Water Quality	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 15.01.11 PM

MEDIA RELEASE - 15 JANUARY 2011

CONTROLLED RELEASES FROM WIVENHOE DAM CONTINUE

NOTE: All SEQ dams remain safe, stable and operating within their design specifications.

Wivenhoe Dam is at 154 per cent, and continues to drop steadily. Releases continue at around 301,000 megalitres per day as part of a strategy designed to draw down the flood storage compartment by mid-next week without contributing to further flooding.

The continuing releases are necessary in order to prepare Wivenhoe for any future weather events should they occur.

Somerset Dam is at 121 per cent and also dropping slowly with about 79,000 megalitres per day being released into Wivenhoe via the sluice gates.

Inflows and water levels in the Brisbane and Pine catchments are being continually monitored.

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 of next 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.

All five gates at North Pine Dam closed this morning.

Gate releases at Leslie Harrison Dam have ceased.

As at 7:00am today, 1,693 megalitres was passing over the spillway at Wyaralong Dam. This represents a water depth of 0.19m over the spillway.

A minor release of around 8,000 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 next 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.

RESIDENTS AND BUSINESSES STRONGLY URGED TO USE WATER WISELY

The connected Water Grid continues to maintain safe and secure water supplies in the face of unprecedented flooding impacts.

Water Treatment Plants across the connected Water Grid are producing at maximum rates however very high demand associated with the clean-up of flood impacts is expected over the weekend.

Given the critical need to ensure adequate water supplies for the clean-up, residents and businesses in areas not directly impacted by flooding are strongly urged to use water wisely.

Within areas affected by flooding, residents should use what water is needed to clean-up immediate flood 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

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**[redacted]

PLEASE NOTE: 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 -** [redacted]. 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**.

For further details contact the Water Grid Communications Unit on:
[redacted]
| Email: watergridmedia[redacted]

TRIM reference: D/	Date and time: 15/01/11 3:30pm
Title : SEQ dam release and flooding update - 15.01.11	
Summary: Water Grid gears-up for the clean-up	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 15.01.11

MEDIA RELEASE - 15 JANUARY 2011: Issued at 3:30pm

Water Grid gears-up for the clean-up

The expected spike in water use this weekend has started with every asset in the Water Grid currently in use.

Real-time bulk water consumption data from LinkWater today showed water use increasing rapidly due to the big clean-up across Brisbane and Ipswich now taking place.

Water Grid spokesperson Barry Dennien said typically Brisbane and Ipswich areas use about 700 megalitres over a weekend period, but already these areas had reached 215 megalitres by mid morning today.

"We've noticed a rapid rise in water use over the last few hours and expect the total to reach over 950 megalitres by tomorrow evening," said Mr Dennien.

"If people see minor discolouration of their tap water, they should not be concerned – Brisbane's water is absolutely safe to drink.

"A precautionary boil water notice has been issued for Marburg, however water across Ipswich and the Sunshine and Gold Coasts also remains safe to drink," he said.

Seqwater maintenance and operations staff are working around the clock to get major water treatment plants back to full production.

"A large spike in water demand so soon after flooding presents a real challenge - but it's a challenge that with the communities help we are up to," he said.

Brisbane's biggest water treatment plant at Mt Crosby is now stretching production to 410 megalitres per day after recovering from significant flood impacts.

The Gold Coast Desalination Plant currently at 66% or 88 megalitres per day is also making an important contribution.

The enormous demand means that within areas affected by flooding, residents should sensibly use whatever water is needed.

Outside flood impacted areas, consumers are also asked to make an extra effort to conserve water by adopting the same water use practices that saw us through the drought.

Together the Water Grid and Queensland Urban Utilities have been working to ensure Lowood, Gatton, Helidon, Fernvale and Laidley are resupplied with drinking water as fast as possible.

Lowood's severely affected pump station and water treatment plant are back on line and are about to supply Lowood, Gatton, Helidon, Fernvale and Laidley.

Queensland Urban Utility crews, who worked through the night, remain on site repairing the town's reticulation system.

"These crews have done a tremendous job to get water supply to these local communities back on line so quickly after some considerable damage" said Mr Dennien.

For more information on boil water notices in the Queensland Urban Utilities supply area, including Somerset and Lockyer Valley, go to **www.urbanutilities.com.au.**

ENDS

Owing to technical issues caused by the flood, a temporary email contact is in use. Please email to **watergridmedia**[redacted]

Community Assistance:
Please direct the community to contact **telephone -** [redacted]. 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.**

For further details contact the Water Grid Communications Unit on:
[redacted]
| Email: watergridmedia[redacted]

TRIM reference: D/	Date and time: 16/01/11
Title : SEQ dam release and flooding update - 16.01.11	
Summary: Controlled releases from Wivenhoe Dam continue	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 16.01.11

MEDIA RELEASE - 16 JANUARY 2011

CONTROLLED RELEASES FROM WIVENHOE DAM CONTINUE

NOTE: All SEQ dams remain safe, stable and operating within their design specifications.

Wivenhoe Dam is at 138 per cent, and continues to drop steadily. Releases continue at around 299,000 megalitres per day. This flow will be maintained to drain the flood storage compartment this week.

The continuing releases are necessary in order to prepare Wivenhoe for any future weather events should they occur.

Inflows and water levels continue to be monitored in the Brisbane and Pine catchments.

Somerset Dam is at 106 per cent and also dropping slowly with about 70,500 megalitres per day being released into Wivenhoe via the sluice gates.

Water levels in Somerset will fall slowly in the next 24 hours.

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 of next 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 96 per cent and all five gates remain closed.

Water has spilled from Wyaralong Dam after it exceeded 100 per cent capacity earlier this 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 next 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.

RESIDENTS AND BUSINESSES STRONGLY URGED TO USE WATER WISELY

The connected Water Grid continues to maintain safe and secure water supplies in the face of unprecedented flooding impacts.

Water Treatment Plants across the connected Water Grid are producing at maximum rates however very high demand associated with the clean-up of flood impacts is expected over the weekend.

Given the critical need to ensure adequate water supplies for the clean-up, residents and businesses in areas not directly impacted by flooding are strongly urged to use water wisely.

Within areas affected by flooding, residents should use what water is needed to clean-up immediate flood 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

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**[redacted]

PLEASE NOTE: 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 -** [redacted]. 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**.

For further details contact the Water Grid Communications Unit on:
[redacted]
Email: watergridmedia[redacted]

TRIM reference: D/	Date and time: 17/01/11 11:05am
Title : SEQ dam release and flooding update - 17.01.11	
Summary: Controlled releases from Wivenhoe Dam continue, Water Quality	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 17.01.11

MEDIA RELEASE - 17 JANUARY 2011

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**[redacted]

PLEASE NOTE: 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 -**[redacted]. 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**.

TRIM reference: D/	Date and time: 18/01/11 11:45am
Title : SEQ dam release and flooding update - 18.01.11	
Summary: Gate closure commenced at Wivenhoe	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 18.01.11

MEDIA RELEASE - 18 JANUARY 2011

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 <u>not</u> 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.

ENDS

PLEASE NOTE: 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 -** [redacted]. 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.**

TRIM reference: D/	Date and time: 19/01/11 10:00am
Title : SEQ dam release and flooding update - 19.01.11	
Summary: Dam update, Water quality	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 19.01.11

MEDIA RELEASE - 19 JANUARY 2011

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

SEQ Water Grid

Media updates issued during the January flood event

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.

A single dam update will now be issued mid-morning each day.

ENDS

PLEASE NOTE: 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 -** [redacted]. 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**.

TRIM reference: D/	Date and time: 20/01/11 10:42am
Title : SEQ dam release and flooding update - 20.01.11	
Summary: Small releases from Wivenhoe Dam after overnight storms	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 20.01.11

MEDIA RELEASE - 20 JANUARY 2011

SMALL RELEASES FROM WIVENHOE DAM AFTER OVERNIGHT STORMS

Last night's storms over the catchment have resulted in one gate being partially opened at Wivenhoe Dam this morning. This will see a small controlled release over the course of today to maintain the dam at or near 100 per cent.

The Bureau of Meteorology has forecast showers and possible thunderstorms later today meaning water releases will be reassessed over the next 24 hours.

Somerset Dam is just over 100 per cent capacity with all sluice gates currently closed. Depending on catchment inflows, further releases into Wivenhoe Dam may be made over the next 24 hours.

The Flood Operations Centre continues to monitor rainfalls and water levels throughout the Brisbane and Pine River catchments and consult with the Bureau of Meteorology and local councils to limit downstream impacts where possible.

While Twin Bridges remains inundated, overnight rainfall in the Lockyer catchment may affect inundation of Savages and Colleges Crossing in coming days. Residents should always contact the local council for detailed information on road crossing closures and other impacts.

Further releases from North Pine Dam began overnight to cater for the inflows from last night's storms. All five gates are currently open and are expected to operate throughout the day.

There have been no further releases from Hinze Dam or Leslie Harrison Dam.

Recreation areas around Somerset and Wivenhoe dams remain closed until further notice due to safety.

Water has spilled from Wyaralong Dam after it exceeded 100 per cent capacity on Tuesday 11 January 2011.

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A single dam update will now be issued mid-morning each day.

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TRIM reference: D/	Date and time: 20/01/11 12:30pm
Title : SEQ dam release and flooding update - 20.01.11	
Summary: Gates now closed at Wivenhoe Dam, Water quality	
Note: Issued to all key media and stakeholders in South East Queensland	

SEQ dam release and flooding update - 20.01.11

MEDIA RELEASE - 20 JANUARY 2011

GATES NOW CLOSED AT WIVENHOE DAM

All gates are now closed at Wivenhoe Dam, after last night's small water release in the wake of storms.

The Bureau of Meteorology has forecast showers and possible thunderstorms later today meaning water releases will be reassessed over the next 24 hours.

Somerset Dam is just over 100 per cent capacity with all sluice gates currently closed. Depending on catchment inflows, further releases into Wivenhoe Dam may be made over the next 24 hours.

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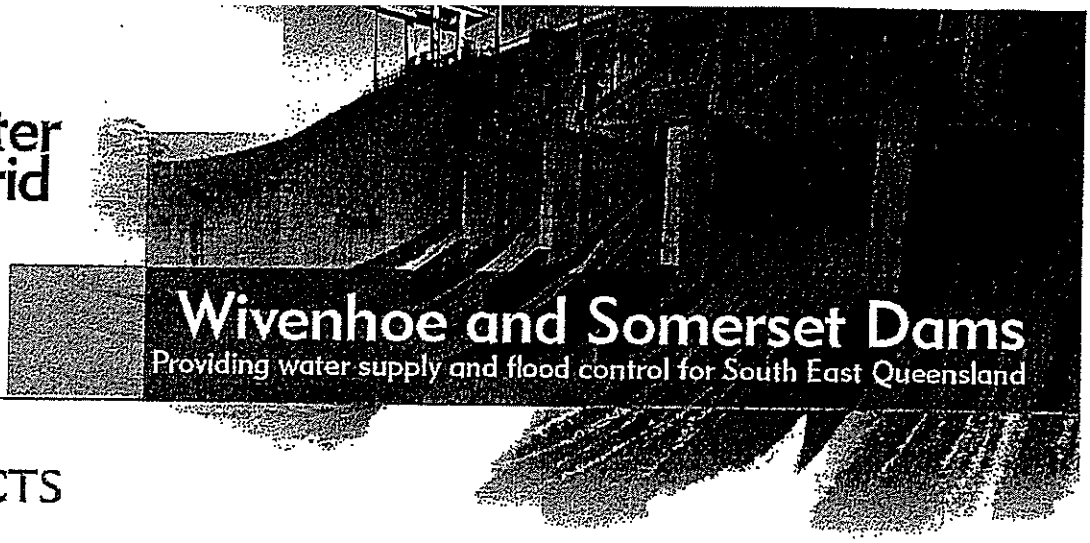
Attachment 2: Wivenhoe Dam factsheet

SEQ Water Grid



Wivenhoe and Somerset Dams

Providing water supply and flood control for South East Queensland

A FEW FACTS

Wivenhoe Dam was built in response to the 1974 floods and is an award-winning feat of hydrological and structural engineering.

Connected to Wivenhoe Dam, Somerset Dam was completed in 1959. In the event of heavy rains, which may cause Somerset Dam to reach capacity, water is released downstream from Somerset to Wivenhoe Dam.

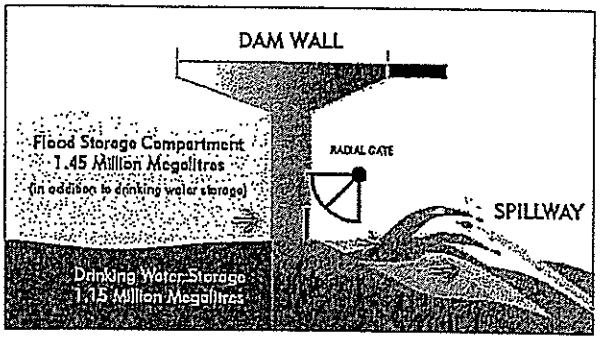
On top of storing 1.15 million megalitres of precious drinking water, Wivenhoe Dam can also store an additional 1.45 million megalitres, equal to 2.5 times the volume of Sydney Harbour. This additional space is known as the dam's flood storage compartment and works to hold back the flood waters which gather in the Brisbane Valley. These flood waters can threaten Brisbane after heavy weather events.

The flood storage compartment at Wivenhoe Dam temporarily stores flood water and releases it at a controlled rate to minimise downstream impacts. Flood levels along the Brisbane River and in the Ipswich and Brisbane urban areas would be much higher without the support of Wivenhoe and Somerset dams.

The Wivenhoe Dam wall is designed to withstand an extreme flood event, much worse than anything on record to date.

In a flood event similar to 1974, there would still be a large amount of local flooding in and around the Ipswich and Brisbane regions, simply due to the heavy local rainfalls. However, water levels along the Brisbane River would be reduced due to the mitigating impacts of Somerset and Wivenhoe dams.

Wivenhoe Dam Flood Storage Compartment



If it wasn't for Wivenhoe and Somerset dams, a considerable number of people, properties and infrastructure could be at an even greater risk of serious flooding. These dams are a crucial component of South East Queensland's flood mitigation plan and something Queenslanders can be proud of.

Spectacular pictures – but why does Wivenhoe Dam have to release stored flood water?

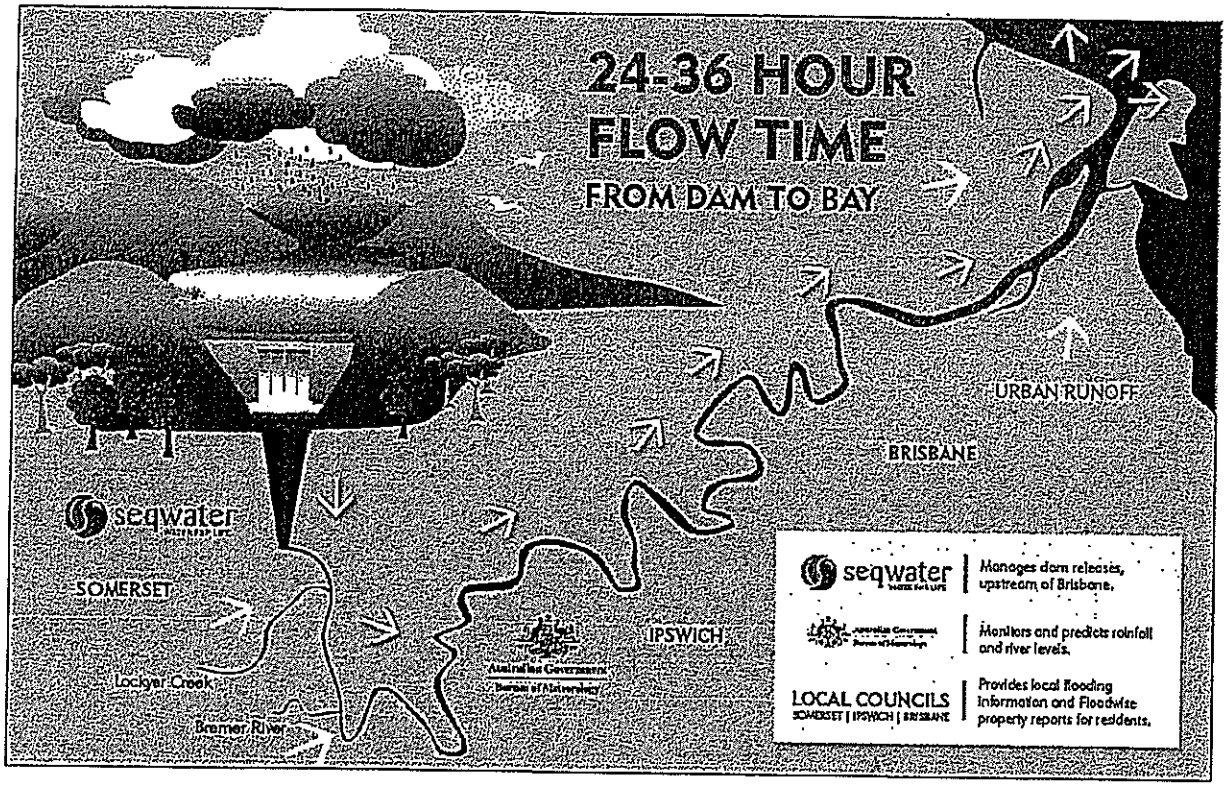
South East Queensland has a weather pattern that often sees prolonged or multiple rain events in close succession.

As soon as Wivenhoe Dam's flood storage compartment begins to fill, it has to be carefully emptied in order to make room for additional heavy rainfall events that may occur. Wivenhoe Dam's flood storage compartment can fill in less than three days following heavy rainfall. This highlights the need for strategic management of dam levels. Controlled releases consider the following flood factors: catchment runoff below the dam wall, urban runoff and river levels.

Following heavy rainfall in October 2010, Wivenhoe Dam received inflows equivalent to almost half the flood storage compartment capacity - in just a few days.

Wivenhoe Dam controls 50 per cent of the Brisbane catchment. It is therefore possible for Brisbane to flood from other sources such as rainfall in the catchment below the dam wall.

A fundamental principle in the management of Wivenhoe Dam is that all floodwater should be released within seven days. This means the greater the volume received in the flood storage compartment, the greater the discharge required.



How are the releases managed?

Before Wivenhoe Dam begins a controlled release from its flood storage compartment, a dedicated 24-hour Flood Operations Centre is activated. The specific purpose of the centre is to manage any potential impacts of releases downstream.

The actions of the Flood Operations Centre are guided by a Flood Mitigation Manual. The Queensland State Government, local councils and relevant emergency services are consulted before the water releases from dams take place, to ensure communities are warned and can take all necessary precautions.

The amount of water released from Wivenhoe Dam depends on the level of water inside the flood storage compartment, as well as the incoming flows and downstream tributaries.

During a major flooding event, the SEQ Water Grid Manager, Seqwater (the dam operators), the Bureau of Meteorology and local councils work together to formulate recommendations. Members of the public and relevant emergency services are then advised on how to best manage impending localised flooding.

Rainfall is continually monitored throughout all South East Queensland catchments during a flood event. The Bureau of Meteorology provides rainfall forecasts to Seqwater who then monitor the surrounding catchments.

Together with weather predictions, a comprehensive network of river sensors, providing real-time data, work to inform the basis for a formulated schedule of controlled dam releases. The schedule works to ensure the maximum protection from flooding in urban areas is achieved.

Based on the weather forecast from the Bureau of Meteorology, and Seqwater's decisions to release water from Wivenhoe Dam, councils then work with residents regarding local area impacts. Councils know their areas best and work to advise residents about road and bridge closures, as well as local flooding.

The following priorities are considered when determining how much water is to be released from Wivenhoe Dam, and at what capacity:

- the structural safety of the dam
- maximising protection from flooding in urbanised areas
- minimising disruption to rural industries along the Brisbane River and Stanley River valleys
- minimising impacts to flora and fauna during the water release phase of a flood event
- the ability to retain the dam at full supply level at the conclusion of a flood event.

How do I find out further information?

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 your local council or visit their website.

Suzie Emery

From: Reilly Bob [Bob.Reilly[redacted]
Sent: Tuesday, 8 March 2011 7:39 AM
To: Dan Spiller; Jim Pruss; Mike Foster; Allen Peter
Cc: Lumley Carol
Subject: FW: Seqwater report Wivenhoe and Somerset dams: DRERM media release
Attachments: Seqwater report Wivenhoe and Somerset dams 070311.doc

Hi everyone

Not sure if you received this release.

Regards

Bob

From: Michaels Paul
Sent: Monday, 7 March 2011 8:14 PM
Subject: Seqwater report Wivenhoe and Somerset dams

Attention news editors... attached for your immediate use is a media release from the Department of Environment and Resource Management...

A Seqwater report on the operation of Wivenhoe and Somerset dams during the January floods is being released today by the Department of Environment and Resource Management.

Paul Michaels
Director, Media Services
Telephone [redacted]
email: paul.michaels[redacted]
Group email: media[redacted]
www.derm.qld.gov.au
Department of Environment and Resource Management
41 George Street, Brisbane Q 4001
GPO 2454, Brisbane Q 4001

Department of Environment and **Resource Management (DERM)**

Media release

Wivenhoe and Somerset dams operation report release

A Seqwater report on the operation of Wivenhoe and Somerset dams during the January floods is being released today by the Department of Environment and Resource Management (DERM).

DERM Director-General John Bradley, who is the regulator of dam safety, said Seqwater, the owner and operator of the dams, had been required to submit the report which would now be published on DERM's website www.derm.qld.gov.au.

"Seqwater's report addresses its compliance with the Flood Mitigation Manual for Wivenhoe and Somerset dams and the scope for potential changes in dam operational arrangements related to flood mitigation" Mr Bradley said.

Mr Bradley said that the scope of the Report was directly relevant to key matters to be assessed by the Commission of Inquiry.

Under its Terms of Reference, the Commission is required to consider the

> "*...implementation of the systems operation plans for dams across the state and in particular the Wivenhoe and Somerset release strategy, and an assessment of compliance with, and the suitability of the operational procedures relating to flood mitigation and dam safety.*"

"Given its direct relevance to the Commission of Inquiry's terms of reference, upon receiving the report, DERM provided it to Commission and consulted it on the appropriateness of its public release."

The Commission is scheduled to provide its Interim Report by 1 August 2011 which will provide recommendations to be addressed prior to the next wet season.

Mr Bradley said DERM would consider the recommendations in the Commission's Interim Report before responding formally to Seqwater's Report and implementing any regulatory changes required prior to the next wet season.

"The report includes Seqwater's assessment of the significance of the January 2011 Flood Event, Seqwater's operational response during the event and Seqwater's assessment of its compliance with the manual and the effectiveness of monitoring, modelling and communications systems.

"The report includes over 1000 pages of technical data in five volumes and so will represent a substantial part of Seqwater's submission to the Commission of Inquiry," Mr Bradley said.

Seqwater is required under the *Water Supply (Safety and Reliability) Act 2008* to submit a report to the department's Office of Water Supply Regulator within six weeks of a major flood event.

ENDS
Date: 7 March 2011
For further information contact Department of Environment and Resource Management Media Services Ph: [redacted] or email media[redacted]