

**IN THE MATTER OF
THE QUEENSLAND FLOODS COMMISSION OF INQUIRY**

**A COMMISSION OF INQUIRY UNDER THE
COMMISSIONS OF INQUIRY ACT 1950**

**AND PURSUANT TO
COMMISSIONS OF INQUIRY ORDER (No. 1) 2011**

SECOND STATEMENT OF JAMES ANDREW PRUSS

On the 21st day of November 2011, I, James Andrew Pruss of 240 Margaret Street, Brisbane, state on oath:

1. I am employed by Queensland Bulk Water Supply Authority (*Seqwater*) in the position of Executive General Manager - Water Delivery. I have held this position since October 2009.

Preliminary

2. This statement provides an account pursuant to a requirement from the Commission, dated 10 November 2011, of the following:
 - (a) the status of the 'Wivenhoe Dam and Somerset Dam Optimisation Study' (*WSDOS*);
 - (b) the work that remains to be done to complete WSDOS and the anticipated timeline for that work to be complete;
 - (c) where applicable, how WSDOS will lead to the implementation of recommendations 2.10, 2.11, 2.12 and 2.13 made by the Commission in its Interim Report;
 - (d) any work that has been done or is planned to be done aside from WSDOS to implement recommendations 2.10, 2.11, 2.12 and 2.13 made by the Commission in its Interim Report (*Further Work*), the anticipated timeline for the Further Work to be complete and, where applicable, how the Further Work will lead to the implementation of the same recommendations made by the Commission in its Interim Report.

Status of WSDOS

3. On 9 May 2011, Seqwater provided the Department of Environment and Resource Management (*DERM*) and the Commission with a draft proposal for WSDOS.

Filed on behalf of: Queensland Bulk Water Supply Authority trading as Seqwater

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4. Exhibited to this statement and marked JP-1 is a copy of the draft proposal for WSDOS prepared by Seqwater dated May 2011.
5. Exhibited to this statement and marked JP-2 is a copy of a letter received from the Minister for Energy and Water Utilities in response to the draft proposal for WSDOS.
6. On 16 June 2011, Seqwater engaged Sinclair Knight Merz (*SKM*) to project manage WSDOS.
7. Exhibited to this statement and marked JP-3 is a copy of a letter received from the Commission dated 18 July 2011 in response to the draft proposal for WSDOS.
8. Following the release of the Commission's Interim Report, an establishment workshop for WSDOS was held on 5 August 2011 and attended by representatives of:
 - (a) Seqwater;
 - (b) SKM;
 - (c) DERM;
 - (d) Queensland Water Commission (*QWC*);
 - (e) South East Queensland Water Grid Manager (*Grid Manager*);
 - (f) Treasury;
 - (g) Department of Community Services;
 - (h) Department of Local Government and Planning (*DLGP*);
 - (i) Queensland Reconstruction Authority;
 - (j) Ipswich City Council;
 - (k) Brisbane City Council;
 - (l) Somerset Regional Council; and
 - (m) Bureau of Meteorology.
9. At the establishment workshop, the composition of the Steering Committee was agreed.
10. A draft Project Management Plan for WSDOS prepared by SKM (Rev 2) was considered at Steering Committee Meeting No.1 on 25 August 2011, where the composition of the respective Technical Working Groups was agreed.
11. Exhibited to this statement and marked JP-4 is a copy of the most recent draft of the Project Management Plan for WSDOS (Rev 4) dated 19 September 2011 (*PMP*).
12. The PMP presents a draft governance structure for WSDOS involving:
 - (a) a Steering Committee chaired by Seqwater;
 - (b) a Joint Technical Working Group (*JTWG*) comprising the following three technical working groups (*TWGs*):


- (i) a Water Supply Security Technical Working Group chaired by the QWC (*TWG No. 1*);
 - (ii) a Flood Management & Dam Operations Technical Working Group chaired by Seqwater (*TWG No. 2*); and
 - (iii) a Floodplain Risk Management Technical Working Group chaired by the DLGP (*TWG No. 3*);
- (c) an Independent Review Panel for the JTWG (*IRP*);
 - (d) a Communication and Engagement Working Group (*CEWG*) chaired by the Grid Manager; and
 - (e) a Stakeholder Reference Group (*SRG*).
13. Since the establishment workshop:
- (a) the Steering Committee has met on four occasions - 25 August 2011, 15 September 2011, 13 October 2011 and 10 November 2011;
 - (b) an establishment workshop for the JTWG occurred on 22 September 2011;
 - (c) the TWG No. 1 has met on four occasions – 5 October 2011, 19 October 2011, 2 November 2011 and 16 November 2011;
 - (d) the TWG No. 2 has met on four occasions – 30 September 2011, 14 October 2011, 20 October 2011 and 3 November 2011;
 - (e) the TWG No. 3 has met on four occasions – 6 October 2011, 20 October 2011, 3 November 2011, and 17 November 2011;
 - (f) the CEWG has met on two occasions – 27 September 2011 and 4 October 2011;
 - (g) potential panellists for the IRP have been identified and were invited to an establishment workshop which occurred over two days on 10 and 11 November 2011. The procurement process for panellists is ongoing and is expected to be completed during December 2011; and
 - (h) an integration forum, to discuss the potential scope of and engagement of a consultant to develop and manage an integrated assessment framework for WSDOS, occurred on 18 October 2011.
14. Agendas and decision registers for the meetings noted above have been provided to the Commission under separate cover letter dated 21 November 2011.

Remaining work and timeline for WSDOS

15. The Steering Committee will provide the Commission and Queensland Government with the first Progress Report for WSDOS in December 2011.
16. Meetings for WSDOS to date have primarily sought to establish, and then agree upon the administrative processes and scope of work for, the relevant groups. These discussions are ongoing.
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17. The meetings of the TWGs to date have focused on the development of the detailed scope of works, which will be reviewed by the IRP once settled within the respective TWGs. Notwithstanding the continued discussions regarding the detailed scope of work by the TWGs, some collation of data and other input information, for example data to underpin the baseline hydrology review, has been progressed by members of the TWGs.
18. The Steering Committee has recently requested Seqwater to verify that the WSDOS process as proposed will meet the expectations of relevant Ministers in relation to the governance structure, scope of works, and proposed outcomes.
19. Seqwater is presently considering that request and upon the conclusion of that consideration intends to discuss the governance structure, scope of works, and proposed outcomes with the Queensland Government.
20. Subject to confirmation from the Queensland Government regarding the proposed governance structure and the direction of the Steering Committee:
 - (a) the SRG will be established; and
 - (b) invitations to consultants to establish an integrated assessment framework for WSDOS will be sought.
21. WSDOS will involve a number of phases including:
 - (a) completion of the technical work by the respective technical working groups;
 - (b) identification of any additional assessment requirements arising from:
 - (i) the 'Wivenhoe Rapid Assessment' study being undertaken by the Office of the Coordinator-General (*Wivenhoe Rapid Assessment*) (see below);
 - (ii) the Final Report of the Queensland Floods Commission of Inquiry (*Final Report of the Commission*); and
 - (iii) any further flood event information arising from any flood events during the 2011/ 2012 wet season;
 - (c) review of the technical work by the IRP;
 - (d) development of a long list of options by the respective technical working groups, JTWG and including interface with the IRP;
 - (e) assessment and refinement of the long list by the respective technical working groups, JTWG and including interface with the IRP, to produce a short list of options; and
 - (f) assessment and refinement of the short list by the respective technical working groups, JTWG and including interface with the IRP, to produce a report of potential options for optimisation of the use of Wivenhoe Dam and Somerset Dam to be presented to the Queensland Government by the Steering Committee.
22. At this stage, it is Seqwater's preference that WSDOS be completed by the end of June 2013.

How WSDOS implements Commission's interim recommendations

23. The Steering Committee for WSDOS has resolved to deliver the recommendations 2.10, 2.11, 2.12 and 2.13 made by the Commission in its Interim Report. The complete list of objectives for WSDOS agreed by the Steering Committee are:
- (a) Deliver recommendations 2.10, 2.11, 2.12 and 2.13 made by the Commission in its Interim Report;
 - (b) Nominate to government (local and State) a range of potential options for optimisation of the use of Wivenhoe Dam and Somerset Dam, informed by:
 - (i) identification of the effects of flooding upon the local and wider community (safety and well-being, damage and economic impact);
 - (ii) the balance across flood management and dam operations, floodplain risk management and water supply security considerations;
 - (iii) strategic consideration of flood risk (including residual risk) and flood behaviour in the decision-making process; and
 - (iv) consideration of and transparent measurement of the economic, social and environmental impacts of a broad range of flood risk management measures (both structural and non-structural);
 - (c) Define roles and responsibilities in terms of management of flood risk for all agencies, entities and Councils; and
 - (d) Improve community awareness of flood risk and response related to the potential options.
24. More particularly in relation to how WSDOS will implement recommendation 2.10 which states:
- Seqwater should act immediately to establish:*
- 1. *a steering committee to oversee the long term review of the Wivenhoe manual including senior representatives of at least DERM, Seqwater, the Water Commission, the Water Grid Manager, Brisbane City Council, Ipswich City Council and Somerset Regional Council*
 - 2. *a technical review committee comprised of independent experts in at least hydrology, meteorology and dam operations to examine all technical work completed as part of the review*
- (a) The Steering Committee for WSDOS has been established and comprises representatives from each of the authorities referred to in recommendation 2.10(1), with the addition of Treasury;
 - (b) The procurement process of the IRP for WSDOS is nearing completion and will comprise independent experts in:
 - (i) hydrology, meteorology and dam operations as referred to in recommendation 2.10(2); and
- 

- (ii) floodplain hydraulics and risk management, water resource planning, economics and climate change;
- (c) Relevant members of the IRP will review all technical work completed by the technical working groups and report to the Steering Committee;
- (d) WSDOS will ultimately produce a range of potential options or scenarios for the optimal use of Wivenhoe Dam and Somerset Dam based on the work of the technical working groups as reviewed by the IRP and as assessed through an integrated assessment framework for the consideration of the State and local governments in determining relevant policy decisions. The decisions of the Queensland Government will eventually determine the scope of any revision to the *Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam (Manual)*.
- (e) This approach is consistent with the rationale for the longer term review of the Manual given by the Commission in the Interim Report on pages 59 and 60 (the following extract is taken from page 59):

It is for the Queensland Government, based on advice as to the results of the review of the Wivenhoe manual and studies into water security and the impact on the floodplain, to endorse a set of strategies which best satisfies the needs of the community. Any decision by government should follow extensive consultation with councils and the community.

The Wivenhoe manual should not be substantially re-written until such a preferred set of strategies is decided upon by the Queensland Government.

- (f) WSDOS will effectively come to an end after the Steering Committee presents the range of potential options to the Queensland Government;
 - (g) Seqwater intends to prepare any revision of the Manual in accordance with the direction of Queensland Government following determination of a preferred set of strategies and otherwise in accordance with Chapter 4, Part 2 of the *Water Supply (Safety and Reliability) Act 2008 (Water Supply Act)*.
25. More particularly in relation to how WSDOS will implement recommendation 2.11 which states:

The steering committee should ensure the scientific investigations and modelling outlined in recommendation 2.12 and 2.13 are completed. It should also assess the need for any other work to be done, and instigate any other investigations or work considered necessary for a full and proper review of the Wivenhoe manual.

- (a) The scientific investigations outlined in recommendation 2.12 will be undertaken by TWG No. 2 and reviewed by the IRP;
- (b) The modelling and assessment work outlined in recommendation 2.13 will be undertaken across all TWGs, be reviewed by the IRP, and outcomes then fed into the overall integrated assessment;
- (c) The work of TWG No. 3, in conjunction with contributions from the CEWG and SRG, will inform the identification of options for the Queensland Government to

consider and is consistent with the best practice approach advocated in *Floodplain management in Australia: best practice principles and guidelines – SCARM report 73*; and

- (d) the inherent flexibility of the proposed governance structure for WSDOS and comprehensive nature of the integrated assessment framework will support the addition and instigation of further investigations or work deemed necessary by the Steering Committee, a TWG, JTWG or the IRP moving forward.

Further Work (in addition to WSDOS)

- 26. As noted above, following the WSDOS process, Seqwater intends to prepare any revision of the Manual in accordance with the direction of Queensland Government following determination of a preferred set of strategies and otherwise in accordance with Chapter 4, Part 2 of the Water Supply Act.
- 27. The timing for this long-term review of the Manual will be dependent upon the State Government's decision on the policy settings for optimising the use of Wivenhoe Dam and Somerset Dam, as the extent of any changes to the Manual will be unknown until such time as the State determines how it wishes to proceed, having considered the options developed within the WSDOS process.
- 28. Also as mentioned above, Seqwater will review whether there are any implications for WSDOS or additional work required outside the WSDOS process arising from:
 - (a) the Wivenhoe Rapid Assessment;
 - (b) the Final Report of the Commission; and
 - (c) any further flood event information arising from any flood events during the 2011/ 2012 wet season.

SWORN by **JAMES ANDREW PRUSS** on 21 November 2011 at Brisbane in the presence of:



Deponent



Solicitor



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SECOND STATEMENT OF JAMES ANDREW PRUSS

INDEX OF ANNEXURES

Annexure No.	Document	Date
JP-1	Wivenhoe Dam and Somerset Dam Optimisation Study – Draft Study Proposal	00.05.2011
JP-2	Letter to Seqwater from Minister for Energy and Water Utilities	Undated
JP-3	Letter to AAR from Commission of Inquiry	18.07.2011
JP-4	Wivenhoe Dam and Somerset Dam Optimisation Study - Draft Project Management Plan – Revision 4	19.09.2011

Filed on behalf of: Queensland Bulk Water Supply Authority trading as Seqwater

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seqwater
WATER FOR LIFE

**WIVENHOE DAM AND SOMERSET DAM
OPTIMISATION STUDY**

DRAFT STUDY PROPOSAL

MAY 2011

EXECUTIVE SUMMARY

Given the magnitude and impact of the January 2011 flood event, questions have been raised about the optimum use of Wivenhoe Dam and Somerset Dam and whether the flood mitigation potential of the dams should be increased. This report proposes a process for an Optimisation Study to determine the best operating procedures for the dams in the current environment. The results of this study would be used to determine the appropriate full supply level arrangements for the dams and to update the *Manual of Operating Procedures for Flood Mitigation (Manual)* that guides the operation of the dams during flood events.

From a technical sense, it is recommended the Optimisation Study progress in three parallel investigations:

1. Water Supply Security Investigation.
2. Flood Mitigation Investigation.
3. Floodplain Development Investigation.

The Water Supply Security Investigation would aim to examine how the full supply levels of the dams are to be set and managed now and into the future. The Flood Mitigation Investigation would examine the benefits and impacts of the many possible options for managing the flood mitigation storage volumes of the dams. The Floodplain Development Investigation would require local authorities to consider how the selection of individual options for managing the dams during flood events will impact the communities within their areas of authority.

Prior to the completion of the Optimisation Study, an interim review of the current Manual is recommended. The intention of the review would not be to change the existing strategies or intent of the Manual in any way, but to simply clarify some wording to assist those readers without expertise in hydrology and flood forecasting.

It is proposed the Optimisation Study be managed by a nominated Steering Committee, with appropriate Technical Committees completing the necessary studies. A suitable Expert Review Committee would examine and endorse the work of the Technical Committees. The aim would be for the preliminary findings of the Study to be completed in time to be considered by the Queensland Floods Commission of Inquiry before it delivers its final report in January 2012.

Finally, community engagement is considered critical to the success of the Optimisation Study as it will allow access to a broad range of information to support the decision-making process. It also allows the community to develop an understanding of the issues behind the decision-making process and the related constraints or opportunities. Importantly, community engagement helps to ensure the final dam management options chosen are the best options to support the future development and prosperity of South East Queensland communities.

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1. INTRODUCTION

Wivenhoe Dam and Somerset Dam were designed as dual-purpose storages to provide urban water to South East Queensland communities and flood mitigation benefits to communities in the Brisbane River basin. However, the dual-purpose nature of the storages leads to conflicting operating objectives. Keeping the dams full maximises their water supply reliability, while maintaining the dams partially empty increases their flood mitigation potential. There are an infinite number of ways the dams can be managed to achieve these conflicting functions. There is no one right answer nor will one answer maximise each of the benefits the dams can provide or fully satisfy the needs of all stakeholders. Balancing these competing functions also has a direct impact on available options for development of the floodplain.

Given the magnitude and impact of the January 2011 flood event, questions have been raised about the optimum use of Wivenhoe Dam and Somerset Dam and whether the flood mitigation potential of the dams should be increased. This report proposes a process for an Optimisation Study to determine the best operating procedures for the dams in the current environment. The results of this study would be used to determine the appropriate full supply level arrangements for the dams and to update the *Manual of Operating Procedures for Flood Mitigation* (Manual) that guides the operation of the dams during flood events.

The challenge in conducting a successful Optimisation Study will be to balance the needs of the community now and into the future with existing dam operating procedures and management practices. Broad community input into the study through Local Governments will allow informed decisions to be made about the way in which the dams are to be operated in the future. Communicating the results of the study back to the public will also help the community to understand how the dams are to be operated in the future and why the selected dam management options were chosen.

Deciding the best way for the dams to be used to optimise their potential benefits involves balancing a number of competing objectives. The primary competing objectives are urban water supply security and flood mitigation. Urban water supply security is improved by storing as much water in the dams as possible however, this in turn reduces the flood mitigation benefits that the dams can provide. These factors also have direct implications for the development and management of the floodplain.

Objectives and potential dam management benefits will also be valued differently by different people. For example, people living in areas upstream of Moggill may place a high value on flood mitigation benefits that maintain roads and bridges free of flood water to reduce rural isolation during flood events. These benefits may be of lesser relative importance to residents living downstream of Moggill that could potentially be impacted by riverine flooding. These benefits may also be of no importance to residents in areas not affected by flooding and whose main concern may be urban water supply security.

A study to optimise the way Wivenhoe Dam and Somerset Dam are operated in the future will need to consider all potential benefits and will require choices to be made against the level of each benefit that will be provided.

2. CONFLICTING OBJECTIVES AND BENEFITS IN MANAGING THE DAMS

Benefits the dams can provide South East Queensland communities are listed in the following tables.

The first table highlights the two primary benefits the dams provide – urban water supply security and flood mitigation. The table also reflects that the primary decision that needs to be made is to determine how the available storage volume in the dams will be allocated between providing storage volume for water supply and providing storage volume for flood mitigation.

PRIMARY BENEFITS OF THE DAMS			
BENEFIT	PRIMARY STAKEHOLDER/S	METHOD OF MAXIMISING BENEFIT	EFFECT OF MAXIMISING BENEFIT
Urban Water Supply Security	Queensland Water Commission	Setting the Full Supply Levels of the Dams as high as possible	Reducing the flood mitigation benefits provided by the dams.
Flood Mitigation	Somerset Regional Council Ipswich City Council Brisbane City Council	Setting the Full Supply Levels of the Dams as low as possible	Reducing the urban water supply security benefits provided by the dams.

Once the balance between water storage and flood mitigation is determined, the way in which the storage volume for flood mitigation is used can be determined by considering the benefits shown in the following table. Determining how best to allocate the available storage volume will be an iterative process as associated benefits will vary greatly as the storage balance is changed and various options are examined.

The following 'Flood mitigation benefits' table highlights the many competing benefits associated with utilising the available flood mitigation storage volume. In general, increasing any particular benefit will adversely affect another benefit (or benefits) shown in the table. Note that the benefits are not listed in any order of importance or priority.

FLOOD MITIGATION BENEFITS OF THE DAMS			
BENEFIT	PRIMARY STAKEHOLDER/S	METHOD OF MAXIMISING BENEFIT	EFFECT OF MAXIMISING BENEFIT
Minimising river bank erosion below Wivenhoe Dam.	Mid Brisbane River Irrigators Association	Extending the drain down time of the dams following the peak of the flood event.	Elevating the levels of Wivenhoe Dam and Somerset Dam following the flood event peak, thus reducing the capability of the dams to provide optimum flood mitigation benefits if impacted by closely spaced flood events.
Minimising the closure of rural Roads and Bridges between Wivenhoe Dam and Moggill.	Somerset Regional Council Ipswich City Council	Delaying the flooding of bridges between Wivenhoe Dam and Moggill as long as possible and minimising the duration of bridge inundation.	Elevating the levels of Wivenhoe Dam and Somerset Dam prior to the flood event peak, thus reducing the capability of the dams to maintain river flows below Moggill below downstream damage thresholds.
Minimising flooding impacts affecting Kilcoy (upstream of Somerset Dam).	Somerset Regional Council	Minimising the level in Somerset Dam.	Elevating the level of Wivenhoe Dam during the flood event, thus reducing the capability of the dams to maintain river flows below downstream damage thresholds.
Minimising flooding impacts affecting housing along the Brisbane River between Wivenhoe Dam and Moggill and including Fernvale.	Somerset Regional Council	Maintaining flows in the Brisbane River to just below the damage threshold over the duration of the flood event.	Prematurely flooding rural Roads and Bridges between Wivenhoe Dam and Moggill; and increasing the risk of damage to downstream areas that have a damage threshold higher than the target flow rate associated with this benefit by elevating the levels of Wivenhoe Dam and Somerset Dam.

FLOOD MITIGATION BENEFITS OF THE DAMS			
BENEFIT	PRIMARY STAKEHOLDER/S	METHOD OF MAXIMISING BENEFIT	EFFECT OF MAXIMISING BENEFIT
Minimising flooding impacts affecting Ipswich.	Ipswich City Council	Maintaining flows in the Brisbane River by aiming to ensure that Bremer River outflows are not affected by backwater.	Prematurely flooding rural Roads and Bridges between Wivenhoe Dam and Moggill; and increasing the risk of damage to downstream areas that have a damage threshold higher than the target flow rate associated with this benefit by elevating the levels of Wivenhoe Dam and Somerset Dam.
Minimising flooding impacts that do not involve the flooding of urban dwellings affecting areas downstream of Moggill.	Brisbane City Council	Maintaining flows in the Brisbane River to just below the damage threshold.	Prematurely flooding rural Roads and Bridges between Wivenhoe Dam and Moggill; prematurely causing upstream flood damage; and increasing the risk of urban damage in Brisbane by elevating the levels of Wivenhoe Dam and Somerset Dam.
Minimising flooding impacts that involves the flooding of urban dwellings affecting areas downstream of Moggill.	Brisbane City Council	Maintaining flows in the Brisbane River to just below the damage threshold.	Prematurely flooding rural Roads and Bridges between Wivenhoe Dam and Moggill; prematurely causing upstream flood damage; and prematurely causing flood damage in Brisbane that does not involve the flooding of habitable floors or urban residences. This may involve flooding of properties that does not result in building damage and well as flooding of parks, roads, bikeways and public walkways.
Protecting the safety of the dams.	(DERM) Dam Safety Regulator	Minimising the lake levels in Wivenhoe Dam and Somerset Dam.	Increasing the risk of flood damage occurring along the Brisbane River below Wivenhoe Dam.

The effect of maximising any one particular benefit will generally result in another benefit being reduced. The challenge in determining the optimum use of the dams, is to establish which flood mitigation benefit carries the most weight or will benefit the most people. In order to do this, it is

important to obtain considered input from all stakeholders which will then allow appropriate trade-offs to be made.

As stated previously in this report, there is no one right answer and it will not be possible to fully satisfy all stakeholders. However, by carefully examining all options, the most appropriate choice that will best meet the needs of the broader community can be selected.

It should also be noted that, regardless of how dam operation procedures may be changed, the dams still have no control over inflows into the Brisbane River that arise from rain falling outside the dam catchment areas. These additional catchment areas, which cover an area in the order of 6,500 km², include the Lockyer Creek, Bremer River and local area catchments. Major flooding in urban areas below Moggill, including urban Brisbane, can occur as a result of flooding from these uncontrolled catchment areas, even if there are no water releases from the dams.

3. NATURE OF THE OPTIMISATION STUDY

As there are many conflicting dam operation objectives, it is proposed the optimisation study takes the form of an 'options study' that examines broadly, in the first instance, the many hundreds of options that can be employed when managing the dams.

Between 5 to 10 options would be expected to be chosen from the initial investigation to undergo more detailed examination prior to a final, preferred option being selected.

From a technical sense, the study would progress in three parallel investigations:

1. Water Supply Security Investigation.
2. Flood Mitigation Investigation.
3. Floodplain Development Investigation.

The following table details the Agencies with the knowledge and tools to lead each of the three separate investigations, as well as the primary stakeholders associated with each investigation.

STUDY COMPONENT	LEAD AGENCY	PRIMARY STAKEHOLDERS
1. Water Supply Security Investigation	Department of Environment and Resource Management (DERM)	Brisbane City Council Ipswich City Council Somerset Regional Council
2. Flood Mitigation Investigation	Seqwater	DERM Brisbane City Council Ipswich City Council Somerset Regional Council
3. Floodplain Development Investigation	A separate study would be conducted in each Local Authority Area impacted by releases from the dams, with the relevant Local Authority within the area leading the study. The three agencies involved would be : <ul style="list-style-type: none"> • Brisbane City Council • Ipswich City Council • Somerset Regional Council 	Communities of South East Queensland.

The work expected to be undertaken in each of the three studies is detailed below.

3.1 Water Supply Security Investigation

The Water Supply Security Investigation would aim to examine how the dams' Full Supply Levels are set and managed now and into the future.

There are significant water supply security risks involved in temporarily or permanently lowering the Full Supply Levels of the dams. Scenario analysis contained in the South East Queensland Water Strategy indicates there is the potential for climate change to negatively impact the region's water supply in the near future. Impacts from climate change may lead to additional water supply infrastructure being required to service communities from 2017, with construction needing to commence by 2014. Reducing the Full Supply Level of the dams may have the potential to bring this timetable forward even further.

As decisions to change the dams' Full Supply Levels have a very direct and significant impact on urban water supply security in South East Queensland, these decisions would be made by the State on the advice of the Queensland Water Commission (QWC). To provide comprehensive advice on this matter, it is expected the QWC would consider:

- The implications for the Water Resource (Moreton) Plan 2007 and the Moreton Resource Operations Plan.
- The implications for South East Queensland Water Strategy.
- The results of the Flood Mitigation Investigation discussed in Section 3.2 of this Report.
- The results of the Floodplain Development Investigation discussed in Section 3.2 of this Report.
- Consultation with and advice from the BoM and the Office of Climate Change on long-term weather patterns and forecasts.

Each of the factors would be examined in detail and recommendations provided on how the Full Supply Levels of the dams would be best set and managed in order to optimise the benefits across South East Queensland communities.

The Water Supply Security Investigation would be undertaken by DERM – the recognised, lead agency in the management of the State's water resources. As the manager of South East Queensland's bulk water assets, Seqwater would implement the operational aspects of the recommendations in accordance with its charter.

3.2 Flood Mitigation Investigation

The Flood Mitigation Investigation would examine the benefits and impacts of the many possible options for managing the flood mitigation storage volumes of the dams. The following matrix shows how the initial flood mitigation options for investigation could be developed.

It should be noted that the number and nature of the options shown are for demonstration purposes only and would need to be finalised in conjunction with all relevant stakeholders before proceeding with an options analysis.

WIVENHOE DAM AND SOMERSET DAM FLOOD OPERATIONS MANAGEMENT OPTIONS MATRIX					
OPTION	VARIABLES				
	Full Supply Level	Weighting provided to maintaining rural bridges between Wivenhoe Dam and Moggill free from flood inundation.	Moggill flow target for Strategies W2 and W3 based on an agreed damage threshold target.	Strategies W4 trigger level.	Additional conditions for examination.
1	64.0 m AHD	Do not flood any bridges prematurely (current approach).	2500 m ³ /s	72.0 m AHD	Drain down the dams within 7 days (current approach).
2	65.0 m AHD	Ignore bridges with a submergence flow less than 400m ³ /s; do not flood the other bridges prematurely.	3000 m ³ /s	73.0 m AHD	Drain down the dams within 14 days.
3	66.0 m AHD	Ignore bridges with a submergence flow less than 1800m ³ /s; do not flood the other bridges prematurely.	3500 m ³ /s	74.0 m AHD	Minimise backwater effects on Bremer River flooding by aiming to keep the Brisbane River at Moggill below 7.0 m AHD.
4	67.0 m AHD	Ignore all bridges.	4000 m ³ /s	75.0 m AHD	
5	68.0 m AHD		4500 m ³ /s	76.0 m AHD	
Total Options	5	4	5	5	3

A similar matrix could produce around 1,500 different dam management options for preliminary investigation under the Flood Mitigation Investigation. Facilitated stakeholder discussions and

workshops would be used to reduce this initial list to 5 to 10 manageable options. These options would then be examined more thoroughly using methods that would include a full hydraulic investigation over a range of design floods and historical floods, to assess the advantages and disadvantages of each option. In the preliminary investigation involving all options, the examination would be undertaken using hydrologic modelling only.

The table below shows the proposed range of design and historical floods for examination. The idealised design floods have the disadvantage of potentially being quite different to actual flood events and therefore can only provide an indication of what may occur during an actual flood event. This was demonstrated clearly during the January 2011 Flood Event.

DESIGN FLOODS (Annual Exceedance Probability)				
1 in 2	1 in 5	1 in 10	1 in 20	1 in 50
1 in 100	1 in 1000	1 in 10000	1 in 100000	PMF

HISTORICAL FLOODS				
February 1893	January 1974	February 1999	October 2010	January 2011

The success of this study relies on a review of the dams' design flood hydrology. The estimates currently available are based on the models calibrated during the *1994 Brisbane River and Pine River Flood Study* and design rainfall estimates generated during the Wivenhoe spillway upgrade. A review of the dams' design flood hydrology would take a number of months and would be best completed once the BoM has updated the design rainfall methodology which will not occur before 2012.

When combined, the tables above and the options matrix in Section 3.1 implies 22,500 model runs would be required to complete the preliminary study. However, this would not be the case as a number of preliminary options are expected to be eliminated without the need for examination against the full range of proposed design and historical events. The final options for examination would be reviewed using a broader range of design and historical flood events than shown in the above tables.

3.3 Floodplain Development Investigations

To properly assess the options determined in the Flood Mitigation Investigation, it is expected Local Authorities would separately consider the potential impact of each dam management option on local communities during flood events, including the potential impact each option would have on flood standards for local authority planning and development. Implementing a new dam management option has the potential to impact existing and new residential and commercial developments and will guide the location of existing and planned essential services in flood affected areas, as well as the town planning and development guidelines for these areas.

It is expected this work would be completed individually by each of the three local authorities impacted by dam releases:

- Brisbane City Council.
- Ipswich City Council
- Somerset Regional Council.

Inputs for the Floodplain Development Investigations would be generated from the Flood Mitigation Investigation and formulated to provide an indication as to how a selected option may impact on existing Floodplain Development Approval processes.

4. INTERIM REVIEW OF THE FLOOD MITIGATION MANUAL

Given the considerable time involved in finalising the Optimisation Study, an interim review of the current Manual is recommended prior to the 2011/12 wet season. The intention of the review would not be to change the existing strategies or intent of the Manual in any way, but to simply clarify some wording to assist those readers without expertise in hydrology and flood forecasting.

To date, the Manual has been an operational document, written by highly experienced professional civil engineers and hydrologists for use by highly experienced professional civil engineers and hydrologists. Although this remains unchanged, it is understood that there may be some benefits in some clarification of the Manual to allow its intent to be understood by the broader community. These benefits will be the focus of the interim review.

4.1 Use of Rainfall Forecasts

The current Manual requires the consideration of rainfall forecasts in operational decision-making. However, the Manual allows a zero weight to be applied to a forecast by requiring the decision-maker to use their professional judgement when estimating the lake levels and stream flow conditions that are likely to occur. In assessing the use of forecast rainfall in making flood releases from the dams, operators must be certain that they will not make downstream flooding worse.

The process of using rainfall forecasts in operational decision-making has been developed in consultation with Australia's premier expert organisation in the area of weather forecasting, the Bureau of Meteorology (BoM). The process is based on advice provided by the BoM in the absence of any credible, conflicting expert advice. Seqwater will maintain this approach unless a substantial body of expert opinion, contrary to the current advice provided by the BoM, becomes available. As this is not expected to occur soon, to employ any other approach at this stage would ignore the advice of Australia's recognised lead agency in weather forecasting and the provider of data, and would be considered very poor operational practice.

Rainfall Forecasts and the January 2011 Flood Event

During the January 2011 Flood Event, many of the quantitative precipitation forecasts (QPF) provided by the BoM were so inaccurate they could not be used to produce model runs that were sensible or consistently reliable. QPFs are not sufficiently detailed in space or time to provide accurate inflows or lake level predictions.

Over the course of the January Event, the QPFs showed the flood event was generally decreasing and at times indicated water releases from the dams should possibly be decreased rather than increased. Accordingly, during the Event, the QPFs were arbitrarily scaled up by the Flood Operations Engineers as, on most occasions, more than the predicted rainfall had already fallen at the time model runs were undertaken. This supports the allowance in the Manual that

a zero weight should be applied to forecasts and professional judgement used when estimating likely conditions and making operational decisions. There was no scientific basis for the scaling up of quantitative forecasts as it was undertaken primarily for the purposes of emergency response planning.

These arbitrarily scaled up model runs were included in the January 2011 Flood Event Report. It has become apparent these model runs provided an impression to those who do not understand flood engineering, that model runs during the Event were indicating the onset of a large flood before the peak of the flood event. This is an erroneous impression. These model runs were purposely designed to show an "ever increasing" flood event for the purposes of emergency response planning and – as explained above, in the Event Data Section of the Flood Event Report and in evidence provided to the Queensland Floods Commission of Inquiry – were not based on what the actual forecasts provided by the BoM were indicating. Readers of the *January 2011 Flood Event Report on the Operation of Somerset and Wivenhoe Dam*, who did not understand this concept, may have been confused as to why the forecast model runs were not acted upon when making operational decisions during the flood event.

With this in mind, it needs to be understood that many of the forecast model runs shown in the Report have no scientific basis and are generally based on data that can be described as being arbitrarily derived for the purposes of emergency response planning only. Unfortunately, the model runs needed to be arbitrarily scaled up as using the official forecast data to produce forecast model runs was generating results that were not supported by actual recorded data.

Again, this reinforces the current approach of taking forecasts fully into account when gathering information on which to base operational decisions, but generally applying a zero weight to a forecast for the purposes of flood event decision-making. This occurs unless other data is available to justify a higher weight being applied to the forecast.

4.2 Issues for clarification

The following aspects of the Manual will be considered as part of the interim review:

- Explain the Intent behind the Manual's requirement to always consider the best available rainfall forecast in flood operational decision, while allowing zero weight to be applied to this forecast data.
- Clarify the intent of the Flood Operations decision making flowchart for Wivenhoe Dam so that it is clear that if the level in Wivenhoe Dam reaches EL 68.5m then Strategy W2 or W3 is to be used as appropriate. This is stated on page 26 of the current Manual.
- Clarify the requirement for minimum outflows when the Wivenhoe Dam level exceeds EL 74.0, to ensure the safety of the dams in accordance with the detail of the Wivenhoe/Somerset Interaction study. This forms the basis of the derivation of acceptable spillway capacity for the dams in accordance with the current Dam Safety

Conditions issued for the dams in accordance with the *Water Supply (Safety and Reliability) Act 2008*.

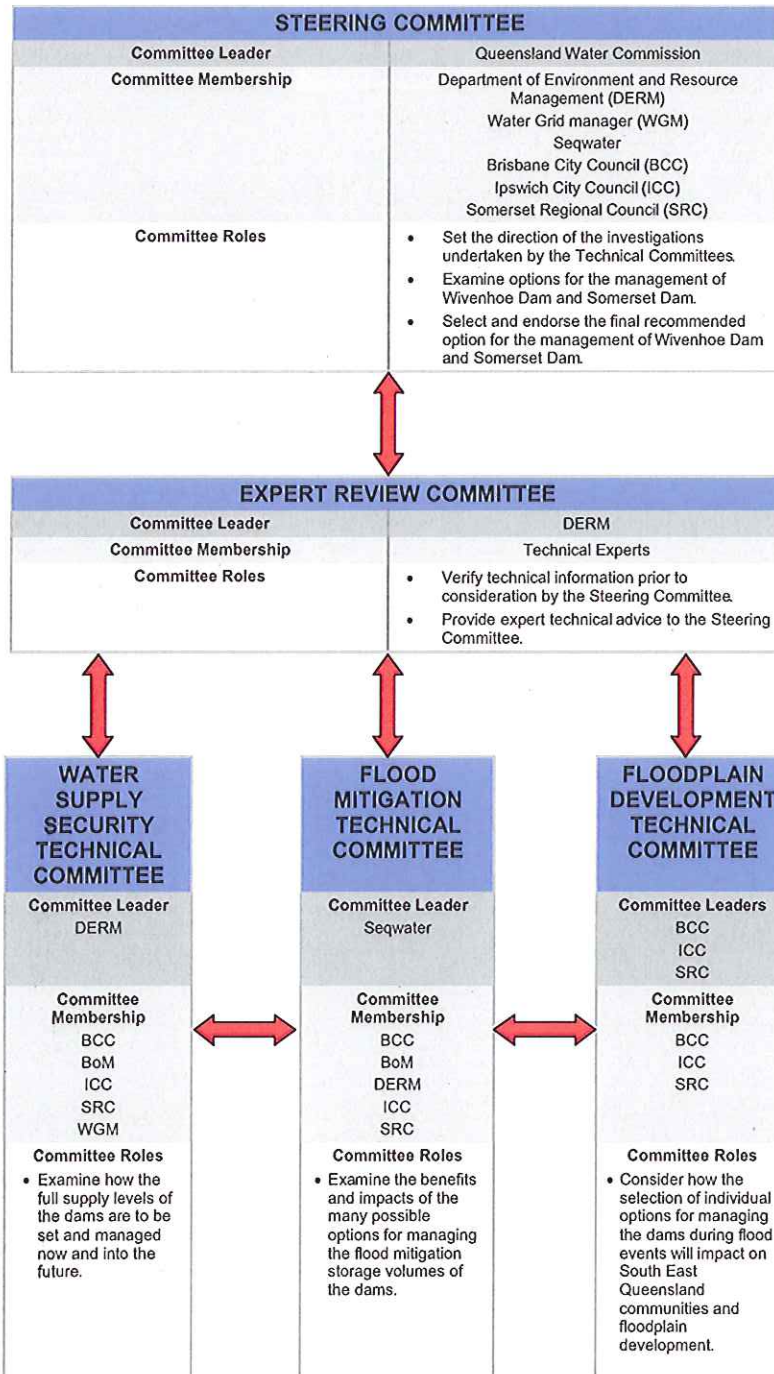
- Clarify technical terms and terms associated with describing the use of professional and technical judgements.
- Correct the arithmetic errors in Appendix J relating to fuse plug outflows.
- Deal with matters which might be raised by the Commission of Inquiry interim report due in August 2011.

There will be no change to the existing intent of the Manual or any operational strategies contained in the Manual. Changing intent or strategies in the Manual would only occur following detailed studies, such as those described in previous sections of this report. Any other approach would involve an unacceptable risk that may significantly reduce the overall flood mitigation benefits currently provided by the dams.

5. PROPOSED STUDY GOVERNANCE PROCESS

5.1 Proposed Governance Structure

The following governance structure is recommended for the management and successful completion of the Optimisation Study.



5.2 Information Sharing between Technical Committees

The Study's success depends upon complete cooperation and information-sharing between the Technical Committees. The existing and already well-established relationships between the agencies involved would support this occurring.

The following critical information flows between the Technical Committees are also required to ensure the Study's success:

- The Water Supply Security Technical Committee would need to advise the Flood Mitigation Technical Committee on the preferred options for dam Full Supply Levels to allow the flood mitigation benefits and impacts of these options to be properly investigated.
- The Flood Mitigation Technical Committee would need to advise the Floodplain Development Technical Committees on the benefits and impacts of the many possible options for managing the dams' flood mitigation storage volumes. This will allow these committees to give appropriate consideration as to how the selection of individual options for managing the dams during flood events will impact South East Queensland communities.

Given the current strong working relationships between many likely members of the Technical Committees, there is a high expectation the Committees would generally interact in a highly-productive and effective manner.

6. COMMUNITY ENGAGEMENT

Community engagement is critical to the success of the Optimisation Study.

Community engagement provides access to a broad range of information that can support the decision-making process that may otherwise not be readily available. It also helps the impacted community understand the issues behind the decision-making process and related constraints or opportunities. The views of the community are considered to be critical in ensuring the selected dam management options are those that will best support the future development and prosperity of South East Queensland communities.

Through the course of the Study, it is expected community engagement processes will be managed by the relevant City and Regional Councils. These authorities are best placed to engage with their own communities through existing engagement mechanisms including established relationships with the community and relevant community organisations.

The widely accepted practice of community engagement involves informing, consulting and active participation within the community.

Informing

It is important the community understands how the Study will aim to balance the current and future needs of the community with existing dam operating procedures and management practices. It is also important the Community understands how they will be able to provide input into the Study. Communicating the results of the Study back to the public will also help the community understand how the dams are to be operated in the future and why the selected dam management options were chosen.

Consulting

Community consultation involves obtaining feedback from the community about dam management options and identifying issues of concern to the community that must be considered as part of the Study. The considerable experience held by Councils in this area, together with their existing consultation networks, will be the key to the success of this component.

Active participation

Active participation involves working directly with community representatives to ensure community wants and needs are consistently understood. Where beneficial to the community, it is expected specifically-identified community representatives participate in meetings of the various Study committees. For example, active participation from community groups such as the Mid Brisbane Irrigators Association and the Fernvale Community Action Group would provide important input to the Study's decision-making processes.

Overall, it is important to consider the views of a community when making decisions about matters that directly affect their lifestyle and future. There are many factors with the potential to influence the decision-making process, including flood impacts, urban water costs, technical considerations, environmental concerns, legal requirements and political commitments. Accordingly, it is important the community has a voice in an issue that will greatly impact the future of South East Queensland.

7. PROPOSED STUDY TIMETABLE

The following draft timetable has been prepared as a guide to show how the Study might progress. The timetable also allows input into the Queensland Floods Commission of Inquiry final report which is due to be handed down in January 2012.

MILESTONE DESCRIPTION	TARGET COMPLETION DATE
Initial meetings of the following committees: <ul style="list-style-type: none">• Steering Committee• Expert Review Committee• Technical Committee.	May 2011
Preliminary Options Report provided to the Steering Committee for consideration.	August 2011
Interim Review of the Manual of Operational Procedures for Flood Mitigation	October 2011
Report containing Investigations of Preferred Dam Operations Options.	December 2011
Initial Recommendations by Steering Committee on Dam Operations.	December 2011

It is unlikely a final report from the Steering Committee will be available until well into 2012 at the earliest. An achievable target would be to have the Steering Committee's final recommendations implemented by the 2012/13 wet season.

"JP-2"



Hon Stephen Robertson MP
Member for Stretton



Queensland
Government

Ref CTS 08836/11

Minister for Energy and
Water Utilities

[REDACTED]
Chairman of the Board
Seqwater
PO Box 16146
CITY EAST QLD 4002

Dear Mr [REDACTED]

I refer to Mr Peter Borrow's letter of 9 May 2011 to Mr John Bradley, Director-General, Department of Environment and Resource Management, outlining a Draft Study Proposal for a Wivenhoe Dam and Somerset Dam Optimisation Study.

I understand that the draft study proposes to optimise the water supply security and flood mitigation outcomes associated with the potential future operation and possible upgrade of the dams. Results of the study would inform any future review of the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam, the South East Queensland Water Strategy and flood plain management by local government.

The South East Queensland Water Strategy, approved and released by the government in mid 2010, previously identified that Seqwater and the Queensland Water Commission should jointly lead a review into the operation of the Brisbane River system to optimise the water supply yield and balance flood storage and water supply storage volume requirements. This action built on the work undertaken in the March 2007 SEQWater report titled "Provision of Contingency Storage in Wivenhoe and Somerset Dams" and was intended to consider the maximum level to which the working storage of Wivenhoe Dam could be raised without raising the dam walls.

In keeping with the South East Queensland Water Strategy recommendations, I request that Seqwater works with the Queensland Water Commission to undertake such work, but with an expanded scope to appropriately incorporate information relevant to recent flooding in the Brisbane River system.

However, I consider that alternative arrangements to those outlined in the Draft Study Proposal sent to Mr Bradley need to be put in place. As the owner and operator of the dams and, ordinarily, the proponent for any design or operational changes, Seqwater should be the Steering Committee leader for the study, continuing and expanding the work commenced in the above 2007 report.

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In addition, I consider that it is more appropriate that the Water Supply Security Investigation Technical Committee leader be the Queensland Water Commission and that the Expert Review Committee leader be provided by either the Queensland Water Commission (which already runs an Expert Panel for Purified Recycled Water) or Seqwater (as the study leader).

The optimisation study should provide an informed view of how to manage and, if necessary, upgrade Brisbane River water and other infrastructure to optimise flood mitigation and water supply security outcomes for South East Queensland, both in the short and longer terms. I am particularly interested in timely advice in respect of operation of the Brisbane River system for the forthcoming wet season and any amendments required to the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam and the Moreton Resource Operations Plan.

The Queensland Floods Commission of Inquiry is also seeking comment on a suggested list of work to be done to review the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam. The Queensland Floods Commission of Inquiry proposes that the work be completed at three different phases: an interim review of the Manual before the 2011-2012 wet season, a longer term review of the Manual and future reviews of the Manual. The work undertaken as part of the optimisation study should consider matters raised by the Queensland Floods Commission of Inquiry.

Clearly, there will need to be appropriate consultation with stakeholders to both scope and undertake the work required for the optimisation study with clearly assigned responsibilities.

The reports prepared as part of the proposed optimisation study would need to be submitted to the Queensland Government, which would consider the financial implications and regulatory matters. Following consideration by the government, the Department of Environment and Resource Management would need to approve any future changes to the Manual of Operational Procedures for Flood Mitigation and any changes needed to the Resource Operations Plan. Likewise, the Queensland Water Commission would need to approve any changes to the System Operating Plan for the South East Queensland Water Grid.

I have asked that the Department of Environment and Resource Management meet with Seqwater and the Queensland Water Commission as a matter of priority to agree a study proposal so that it can be sent to other stakeholders for comment.

I look forward to being regularly updated on the progress of the work required.

Yours sincerely




STEPHEN ROBERTSON MP

"JP-3"

Our ref: Doc 1657105

18 July 2011


Allens Arthur Robinson
Level 31
Riverside Centre
123 Eagle Street
Brisbane QLD 4000

By email

Dear Mr Ilott

Seqwater- Optimisation Study

I refer to your letter of 11 July 2011.

The Commission does not consider it any part of its functions to approve of, or object to, any work which your client might wish to carry out. As you will be aware from the draft recommendations provided to you, the Commission intends to make certain proposals for interim and longer term review of the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam. It is ultimately for the State Government, your client and other parties to decide whether to implement the Commission's recommendations.

Yours sincerely



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"JP-4"

SINCLAIR KNIGHT MERZ
SKM

Wivenhoe Dam and Somerset Dam Optimisation Study

PROJECT MANAGEMENT PLAN

- Rev 4
- 19 September 2011

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Wivenhoe Dam and Somerset Dam Optimisation Study

PROJECT MANAGEMENT PLAN

- Rev 4
- 19 September 2011

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1. Introduction

1.1. Background

During the summer of 2010/11, greater than average rainfall fell in South-East Queensland, associated with a La Nina weather event in the Pacific Ocean. In January 2011, significant rainfall fell in the catchment of Wivenhoe and Somerset Dam, as well as in the catchments of Lockyer Creek and the Bremer River. As a result, a major flood event occurred in the greater Brisbane River catchment area, with major impact upon the communities of Brisbane City, Ipswich City and Somerset Regional Councils (as well as elsewhere). A major flood event also occurred in the North Pine Dam catchment, although impacts were not as significant.

On Monday 17 January 2011, the Queensland Premier established an independent Queensland Floods Commission of Inquiry (QFCI) to examine the flooding that had impacted 70 per cent of the State. On 1 August 2011, the QFCI released an Interim Report, making 175 recommendations to the State Government on matters associated with flood preparedness prior to the 2011/12 wet season.

In Section 2.5.8 of the QFCI August 2011 report 'Longer term review of the Wivenhoe Manual', the following specific recommendations were made:

'2.10 Seqwater should act immediately to establish:

1. a steering committee to oversee the long term review of the Wivenhoe manual including senior representatives of at least DERM, Seqwater, the Water Commission, the Water Grid Manager, Brisbane City Council, Ipswich City Council and Somerset Regional Council
2. a technical review committee comprised of independent experts in at least hydrology, meteorology and dam operations to examine all technical work completed as part of the review.

2.11 The steering committee should ensure the scientific investigations and modelling outlined in recommendation 2.12 and 2.13 are completed. It should also assess the need for any other work to be done, and instigate any other investigations or work considered necessary for a full and proper review of the Wivenhoe manual.

2.12 The following scientific investigations should be carried out prior to modelling work under the supervision of the steering committee and reviewed by the technical review committee:

1. review of the design hydrology:
 - a. using a stochastic or Monte Carlo or probabilistic approach
 - b. taking into account observed variability in temporal and spatial patterns of rainfall

- c. taking into account observed variability in relative timings of inflows from the dams and downstream tributaries.
2. production of a digital terrain model incorporating a bathymetric survey of all critical sections of creeks and rivers upstream and downstream of the dam relevant to flood modelling
3. assessment of the reliability of the 24 hour, the three day and the five day rainfall forecasts
4. consideration of whether and how weather radar can be incorporated into decision making
5. requesting information from the Bureau of Meteorology as to its willingness to provide ensemble forecasts
6. consideration as to whether and how ensemble forecasts can be incorporated into decision making.

2.13 The following modelling work should be carried out under the supervision of the steering committee and reviewed by the technical review committee:

1. modelling across the range of full supply levels, operating strategies and flood events (historical, design and synthetic) in each case assessing the consequences in terms of risk to life and safety and economic, social and environmental damage. In terms of operating strategies, using a full range of strategies including
 - a. a stepped change from W3 to W4
 - b. moving to a higher rate of release earlier in W1
 - c. bypassing W1
 - d. altering maximum release rates under W3
 - e. operating the gates in conjunction with the initiation of any of the fuse plugs in order to achieve a lower rate of discharge
2. simulations to test the robustness of relying on the 24 hour, the three day and the five day rainfall forecasts
3. development of a probability distribution for the time between closely spaced flood peaks in the catchment using historical records.

1.2. Overview of Project/Study

To respond to the January 2011 event and recommendations 2.10 to 2.13 of the QFCI, it is proposed to undertake a comprehensive optimisation study of the operation of the Wivenhoe and Somerset Dam system for both water supply and flood mitigation.

It is envisaged the study scope of work will consist of a number of different components, which will need to be integrated. These components include:

- Flood control and management options/strategies;
- Floodplain development impact, strategic options and risk management;
- Assessment of associated water supply security impacts and options;
- Development of an economics assessment framework to provide a clear and uniform basis for the comparison and selection of preferred options and that this framework be based on outcomes achieving desired objectives, least economic/social/environmental cost and risk management effectiveness.

Ultimately, it is expected the optimisation study will progress the investigation, assessment and evaluation of options, resulting in the nomination of options or scenarios for government consideration. The process will involve consultation with the community and is likely to provide the basis for review of the flood operations manual and updated flood emergency planning, consistent with the nominated options. Considerations beyond the study may also progressively extend to assessing the impacts upon and potential amendments required for State and Local Government planning instruments and policies.

The optimisation study will be multifaceted and have significant interactions, both technical and stakeholder based. The stakeholders will include relevant State Government Departments, Water Grid entities, Local Government Authorities, QFCI, legal representatives, the media and the community. As such, the study will generate significant public awareness and scrutiny.

1.3. Purpose of Document

The purpose of this Project Management Plan (PMP) is to:

- Describe the Project/Study Governance Framework;
- Define the project management approach, including outlining the scope of work, roles and responsibilities, deliverables, Study schedule, Risk and HSEC management, quality and document management;
- Outline the reporting and communication protocols for the project.

1.4. References/Key Documents

A substantial number of documents have been produced regarding Wivenhoe and Somerset Dams and flooding/flood management in the greater Brisbane area. Many of these have been tabled during the course of the Queensland Floods Commission of Inquiry. It is not intended to reference all documents here; instead these will be referenced, as appropriate, in the supporting technical and other studies.

The Queensland Floods Commission of Inquiry 'Interim Report' (August 2011) is referenced in a number of locations in this PMP.

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2. Project Governance Framework

2.1. Introduction

This section outlines a proposed Project Governance Framework for the Wivenhoe Dam and Somerset Dam Optimisation Study (WSDOS). Given the study involves a range of different organisations and complex tasks, a clear governance structure will be essential in ensuring project outcomes are achieved.

This section outlines the project objectives, defines the governance structure, membership, roles and responsibilities for the Study.

2.2. Overarching Project/Study Objectives

The Steering Committee has agreed upon the following Objectives for WSDOS:

1. Deliver **recommendations 2.10-2.13** of the interim QFCI report
2. Nominate to government (Local and State) a range of potential options for a range of potential scenarios for optimisation of the use of Wivenhoe Dam & Somerset Dam, informed by:
 - identification of the effects of flooding upon the **local and wider community** (safety and well-being, damage and economic impact)
 - the **balance** across flood management and control, floodplain risk management and water supply security considerations
 - strategic consideration of **flood risk** (including residual risk) and **flood behaviour** in the decision making process
 - consideration of and transparent measurement of the **economic, social and environmental impacts** of a **broad range of flood risk management measures** (both structural and non-structural)
3. **Roles and responsibilities** in terms of management of flood risk are **defined** for all agencies, entities and Councils
4. Improve **community awareness** of flood risk and response related to the potential options

It is noted that these objectives may be refined, following consideration by the various Technical Working Groups, including as part of detailed scope deliberations. However, any final decision to amend these objectives will sit with the Steering Committee.

2.3. Key Performance Indicators

Proposed **project outcome (success)** key performance indicators (KPIs) are listed below:

- Achievement of the desired project objectives.
- Timely and effective assessment of options, consistent with the agreed project schedule and as the basis for implementation.
- Achievement of project stakeholder ownership relating to the project objectives and deliverables including the quality of technical and associated reports.
- Incorporation of flexibility for future changes in performance criteria (such as for climate change).
- A safe and healthy environment for all of those involved in the Study activities (measured through safety statistics in the first sense, but also through environmental, community, team or stakeholder feedback).

Proposed **relationship based** key performance indicators (KPIs) are listed below:

- Achievement of the desired values and shared behaviours (see Section 2.5).
- Evidence of leadership from different organisations in driving components of the Study.
- Collaboration in developing the Scope of Work, assessment and project outcomes.
- Minimisation of stakeholder and team turnover and maintenance of knowledge base throughout the Study.

Proposed **project management** key performance indicators (KPIs) are listed below. These KPI's are to be assessed on a quarterly basis:

- Project milestones and costs assessed against agreed schedules and cost baselines.
- Deliverables and report quality.
- Encouragement and facilitation of the relationship based objectives, including leading by example.
- Overall performance assessed through feedback.
- HSEC – drive a culture, consistent with the broader goal of a safe and healthy work environment.

2.4. Project Governance Principles and Objectives

The core principles that underpin the Project Governance Framework are:

- Coordination – provide appropriate forums for coordination across project, across Study members and across government agencies.
- Decision making – be empowered to make decisions to allow the study to progress, define authority for decisions making and empower facilitation of decision making at appropriate levels
- Partnership – joint outcomes being achieved through effective stakeholder relationships.
- Certainty of outcomes – recognise the objectives of each stakeholder and work collaboratively to provide certainty of outcomes for each party.
- Resourcing – support implementation with appropriate resourcing.

This Project Governance Framework:

- Defines the relationships between the Study members (and stakeholders) involved in the project.
- Defines the proper flow of information to all Study members and stakeholders.
- Ensures the appropriate review of issues encountered within each component study or assessment.
- Ensures that required approvals and direction for the project are obtained at each key stage of the project.

The implementation of the Project Governance Framework is intended to achieve the following objectives:

- More durable project outcomes through increased ownership by Study members.
- Foster trust between partners and promote collaborative leadership.
- Ensure that both the project goals and requirements of individual organisations/agencies are met.
- Promote open, accurate and timely communication.
- Timely and effective decision making through clearly defined responsibilities and relationships between all groups involved in the project (both internal and external).
- Proactive identification and management of project risks and emergent issues.
- Greater support for action through coordinated mobilisation of resources.

It is critical that members recognise that the role they play in the Project Governance Framework, and whilst representative of their individual entities or agencies, are focused on the delivery of the broader whole of government and community project outcomes.

2.5. Values and Behaviours

While the Governance Framework outlines the key roles and responsibilities, the overarching values and behaviours of all involved in the Study and its governance will also be critical in achieving the project outcomes.

These shared values and behaviours include:

- Willingness to communicate in an open and honest way.
- Commitment and willingness to make collaboration succeed
- Being decisive and accountable.
- Own and respect team decisions.
- Promoting mutual trust and long-term commitment.
- Assigning adequate organisational resources.
- Prioritising project outcomes over individual organisations' agendas.
- Timely response and engagement.
- Focus on solutions in a 'no blame' culture.
- Commitment to the project and its outcomes.

These behaviours and values are also reflected in the proposed relationship based performance objectives.

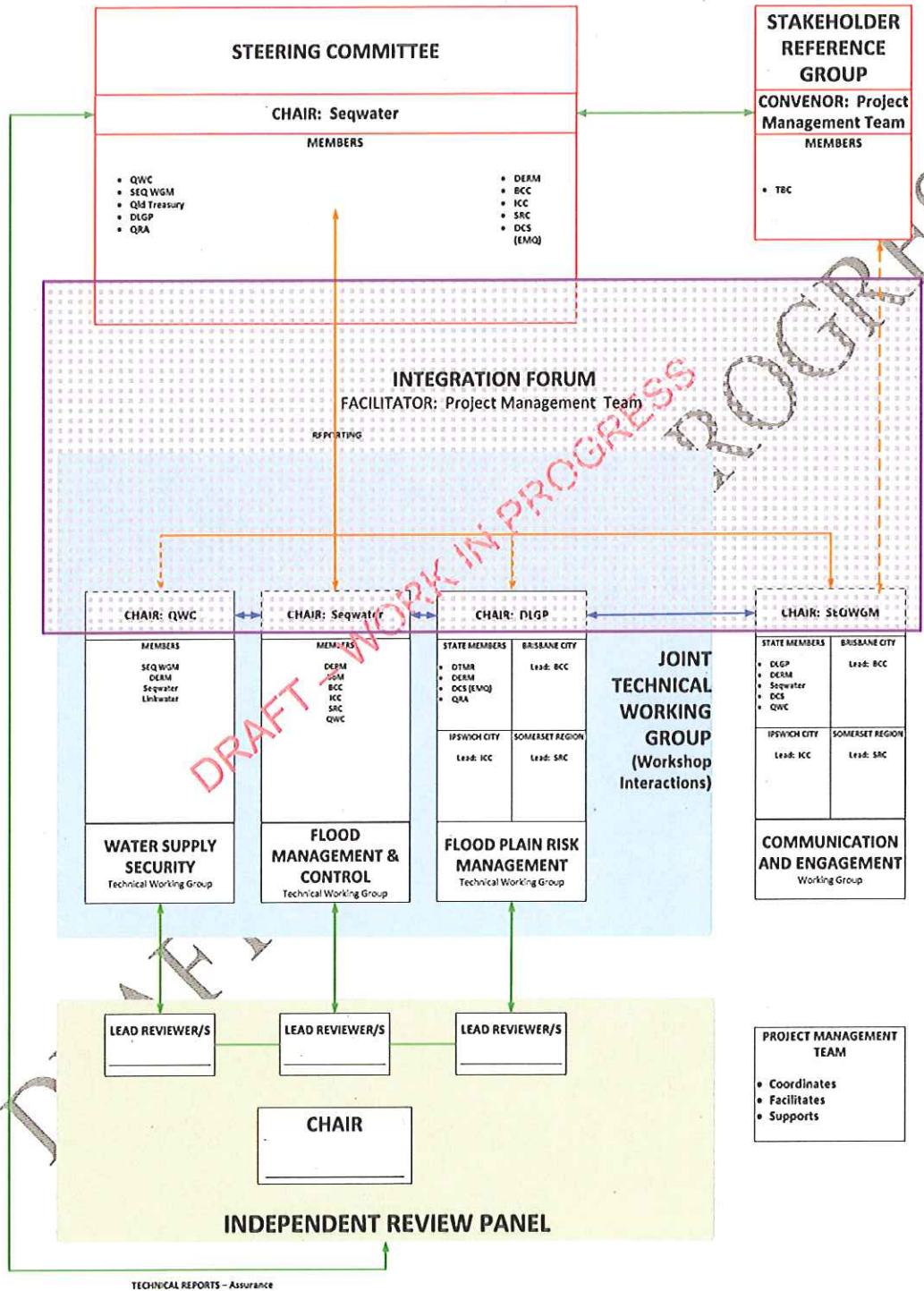
2.6. Project Governance Framework Overview

2.6.1. Governance Structure Overview

The proposed Project Governance Structure/Framework is summarised on the following page in **Figure 2-1**. The remainder of this section provides more details on the roles and responsibilities within this framework.

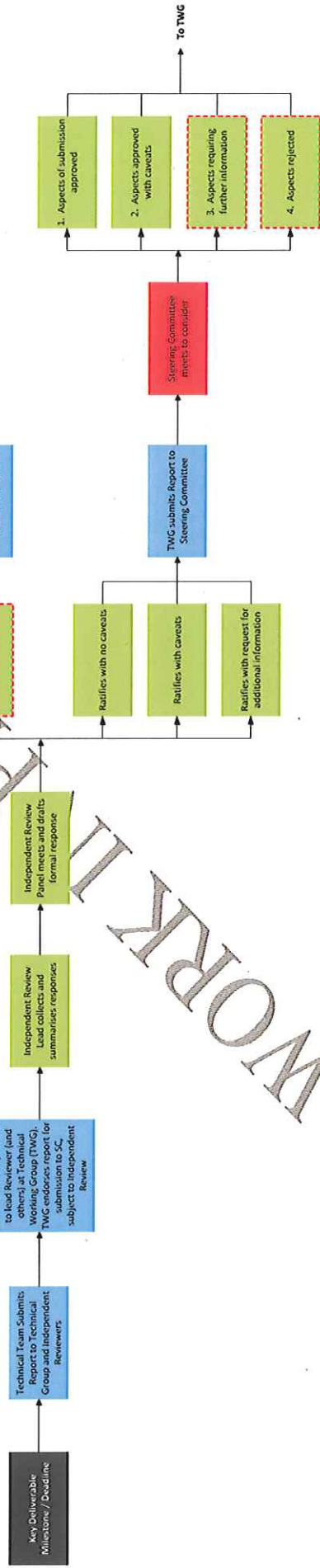
2.6.2. Workflow and Process Overview

While the following sections outline the workflows and processes for particular groups within the Governance Framework, **Figure 2-2** to **Figure 2-4** provide an overview of the key project processes and the workflow and roles involved in delivering project outcomes, decision making and approvals.



■ Figure 2-1 Governance Structure

TECHNICAL REPORTS

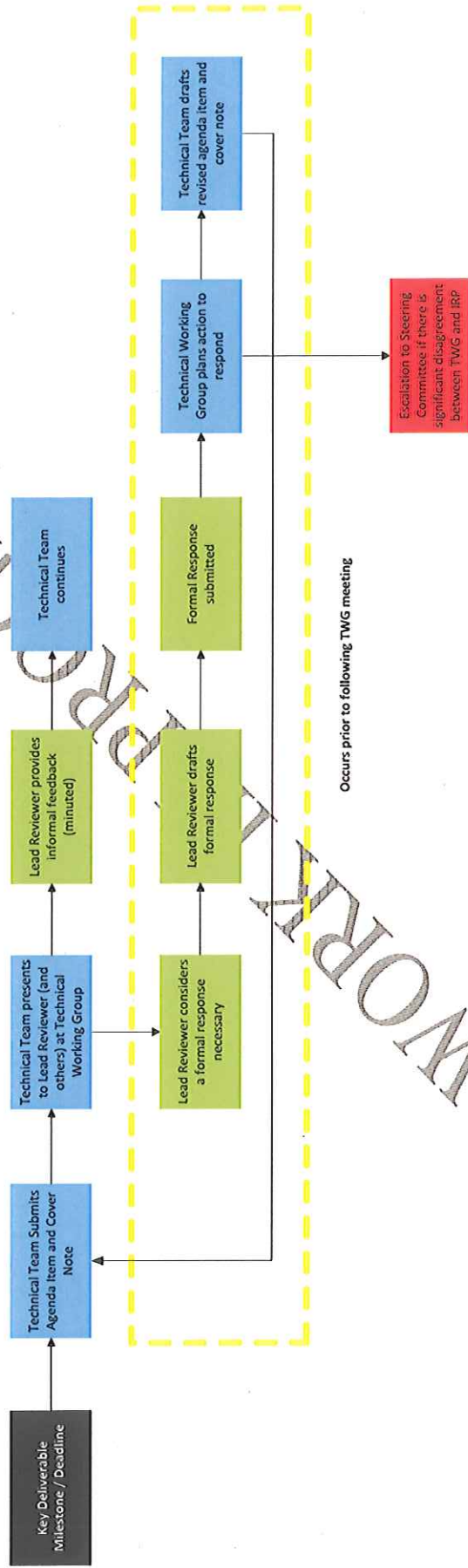


0109154 - Technical Report v04

■ Figure 2-2 Workflow for technical reports

DRAFT - WORK IN PROGRESS

KEY TECHNICAL MILESTONES IN STUDY / ASSESSMENT DELIVERY

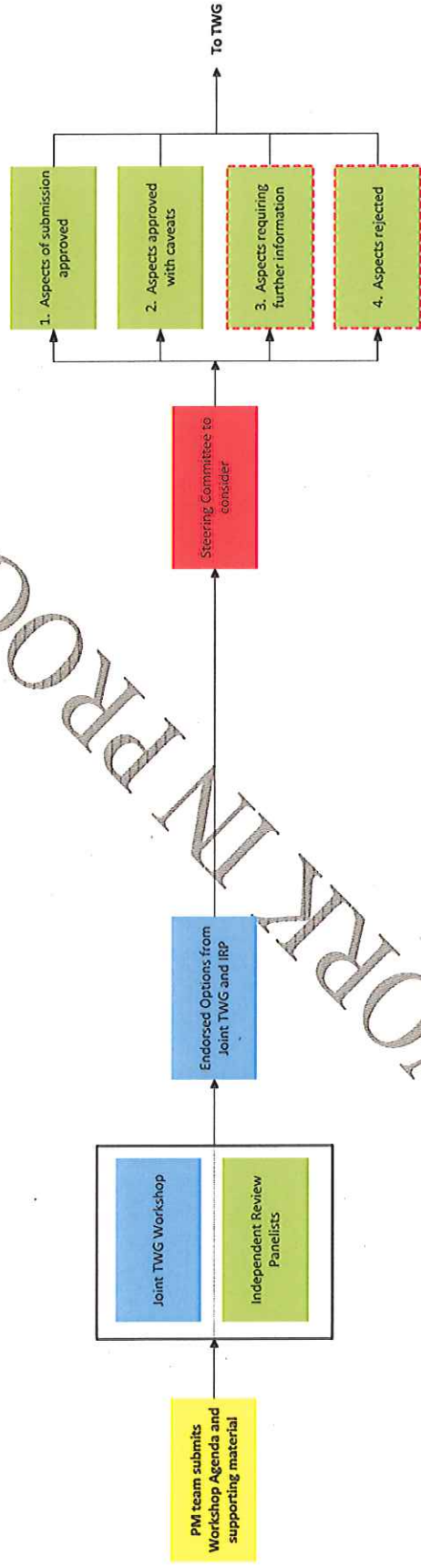


QE09934 - Key Technical Milestones.vsd

■ Figure 2-3 Workflow for key technical milestones

DRAFT - WORKING IN PROGRESS

JOINT / COLLABORATIVE ASSESSMENT OF OPTIONS



QE09934 - Joint - Collaborative Assessment of Options - Option 1.vxd

■ Figure 2-4 Workflow for Collaborative decision outcomes



2.6.3. Steering Committee

The Steering Committee has overall responsibility for the project success and should focus on strategic decisions to ensure that the project outcomes are fit for purpose and realise the objectives of the project.

Responsibilities

- Ownership of the project outcomes.
- Provides overall direction and leadership for the delivery of the project (and in particular sets the direction of the investigations undertaken through the Technical Working Groups).
- Accountable for ultimate delivery of the project.
- Provides resolution of issues raised through the Integration Forum, Technical Working Groups or Independent Review Panel.
- Empower the Technical Working Groups to make decisions within the scope of their roles.
- Accountable for key strategic decisions around project outcomes (such as nomination of options/portfolio of options for State and Local government consideration).
- Exhibit leadership behaviour at all times.
- Take a 'bigger picture' perspective, as compared to focusing upon the needs of individual organisations solely.
- Accountable for ensuring the Project Governance Framework is implemented.
- Maintains the alignment of the project with other government initiatives and related processes.
- Manages the interface of the project with external stakeholders.

Work flows and processes

The Steering Committee will have regular monthly meetings to receive project updates, review project progress and approve/comment on or note any submissions.

- Material will be provided to the Steering Committee four (4) working days prior to the meeting for review.
- A standard agenda format will be agreed to and followed.
- Steering Committee decisions and notations will be documented, in the form of a Decisions Register.
- A Decisions and Actions Register will be produced, reviewed and updated at each Steering Committee meeting.
- Beyond the above, minutes of meetings will not be produced.

- Documented approval or comments will be produced addressed to each of the Technical Working Groups, in response to submissions.
- In terms of organisational reporting, beyond the agreed Communications Plan, members are to only report details consistent with the Decisions and Actions Registers as well as an outline of broader processes and status.

The Steering Committee may be required to have out of session meetings where immediate decisions are critical to the project timeline.

The Steering Committee will review submissions and documents provided by the each of the Technical Working Groups (or Joint Technical Working Group where appropriate), supported by material provided by the Project Management Team, or request a presentation of the contents, as required. The Steering Committee will also be presented with written ratification / advice from the Independent Review Panel as part of the assurance process. The Steering Committee may request to meet directly with the Independent Review Panel as required, including seeking advice.

The Steering Committee will provide a written response (approval or comments) to Technical Planning Group submissions which outlines:

- Aspects (all or part) of the submission that are approved with no further work required.
- Aspects of the submission that are approved with caveat (for example , with some further analysis required).
- Aspects of the submission where the Steering Committee requires changes or further information before forming a decision.
- Aspects of the submission that the Steering Committee does not approve.

Membership

The Steering Committee membership is proposed to consist of senior level executives from the following organisations:

- Seqwater (Chair)
- Queensland Water Commission (QWC)
- Department of Environment and Resource Management (DERM)
- SEQ Water Grid Manager (WGM)
- Brisbane City Council (BCC)
- Ipswich City Council (ICC)
- Somerset Regional Council (SRC)
- Department of Local Government and Planning (DLGP)
- Queensland Treasury (Treasury)

- QLD Reconstruction Authority (QRA)
- Department of Community Safety (DCS (EMQ)).

Given the level of responsibility of the Steering Committee, membership should be selected to ensure that members are able to make the contribution required. The following key attributes are required:

- Necessary seniority to be able to take on the responsibilities required of the role.
- Understanding of the objectives of the project and the work of each of the Technical Working Groups.
- The ability to command respect and to create a sense of community amongst the project members.
- Sufficient seniority and credibility to advise Technical Working Groups on their projects.
- The ability to find ways of solving and pre-empting problems, along with an understanding of cause and effect.
- Ability to demonstrate commitment to the process and show leadership values and behaviours in all dealings.

2.6.4. Independent Review Panel

The Independent Review Panel provides assurance on technical outcomes from the Technical Working Group processes. This role spans from formal assurance of technical information prior to consideration by the Steering Committee, through to more informal engagement with the Steering Committee or Technical Working Group on specific matters of concern.

Responsibilities

- Accountable for assurance and ratification of technical material and Reports (received from Technical Working Groups), prior to consideration by the Steering Committee
- Provide expert technical advice to the Steering Committee as required
- Attend selected Technical Working Group Meetings to provide informal technical advice and review

Work flows and processes

The following summaries the key processes for the Independent Review Panel.

1. An Initial Independent Review Panel meeting to:
 - a. Introduce the Independent Review Panel Members.
 - b. Outline the project, governance framework, key deliverables and timelines.
 - c. Select a Chair and a Lead Reviewer for each Technical Working Group area (or discipline – there may be more than one discipline within a Technical Working Group, for example

hydrological, hydraulic and meteorological review will all be required for the Flood Management and Control Technical Working Group). The Lead Reviewer will be a member of the Independent Review Panel and be responsible for coordinating the Independent Review Panel response to key technical milestones and reports for the given Technical Working Group.

2. Lead Reviewer and other relevant Independent Review Panel members to attend Technical Working Group Meetings (or Joint Technical Working Group Meetings) at key technical milestones to provide input to technical process.
3. Review key project technical reports (all) and Steering Committee Submission documents (where relevant):
 - a. Reports will be provided by each of the Technical Working Groups or Joint Technical Working Group.
 - b. Individual reviewers will provide comments on the reports to the Lead Reviewer, who will summarise the responses.
 - c. The Lead Reviewer is to communicate (via email or teleconference if required) to Independent Review Panel to:
 - i. compile/collated responses from other Panel members;
 - ii. discuss any integration issues;
 - iii. agree on a final recommendation or ratification.
 - d. If the Independent Review Panel requires further information, the Lead Reviewer can contact the report author for further details. If this process does not quickly resolve any outstanding queries, an out of session Independent Review Panel meeting can be held with the relevant members of the Technical Working Group and the report authors. If this cannot resolve the issue, then the matter should be escalated to the Steering Committee, for consideration.
 - e. When ratifying a report to the Steering Committee, the Independent Review Panel can:
 - i. Ratify the submission without caveats;
 - ii. Ratify the submission and provide observation or caveats for Steering Committee consideration;
 - iii. Ratify but request additional work to be undertaken for later consideration;
 - iv. Request additional information prior to final decision on assurance;
 - v. Reject submission and request the Technical Group to reconsider.
4. Where the Steering Committee requests additional expert technical advice from the Independent Review Panel, the Panel will respond accordingly. This may take the form of:

- a. Out of session advice coordinated by the relevant Lead Reviewer;
- b. An Independent Review Panel meeting to agree a response to the Steering Committee;
- c. Attendance of relevant Independent Review Panel member/s at a Steering Committee Meeting.
- d. Drafting of a Guidance Note by the Independent Review Panel

Membership

The Independent Review Panel membership will consist of technical experts across the following disciplines:

- Flood Modelling
- Hydrologic Modelling.
- Hydraulic Modelling.
- Meteorology
- Water Resource / Security Modelling.
- Economic Assessment and Risk Assessment.

The following key attributes are required of Panel members:

- Recognised technical expertise in one of the required disciplines.
- The ability to provide constructive review to inform Steering Committee decisions.
- The ability to engage with Technical Working Groups and Technical study teams to improve technical decisions and to engage with other disciplines.
- Senior management attributes.

2.6.5. Technical Working Groups

The Technical Working Groups will be established for each of the key technical project areas and the delivery of the individual Technical Reports.

Technical Working Groups will be established around each the following Technical areas:

- Flood Control / Management Options.
- Water Supply Security Assessment.
- Floodplain Risk Management Assessment.

The Joint Technical Working Group will be a combined meeting of the individual Technical Working Groups.

Responsibilities

Responsibilities of the Technical Working Group include:

- Accountable for leading and managing the coordination of the Technical Packages or Reports.
- Engage and manage the Technical Team.
- Refine and detail the Scope of Work for the Technical Team.
- Propose matters for Decision or Note for the consideration of the Steering Committee.
- Managing and resolving any risks and other issues that may arise.
- Coordinating engagement with Independent Review Panel and appropriate input into project process.
- Accountable for endorsing Technical Reports and making recommendations to the Steering Committee.

Responsibilities of the lead organisation for each of the Technical Working Groups include chairing and coordinating involvement of the Technical Working Group and providing oversight to all activities. Where any organisation within the Technical Working Group engages a study activity, that organisation shall be responsible for ensuring that key project deliverables are meeting the required outcomes and timeline.

Work flows and processes

The following summaries the key processes for the Technical Working Groups.

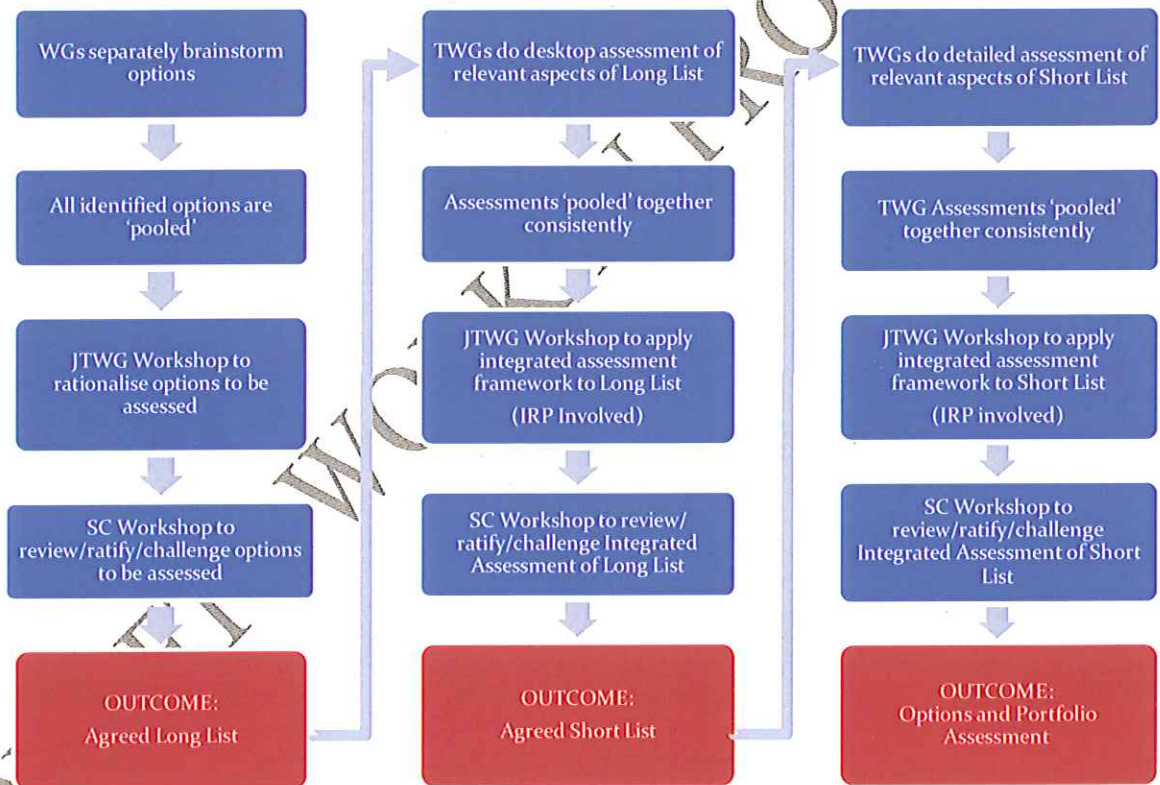
1. Initial Technical Working Group meetings to:
 - a. Outline the project, governance framework, key deliverables and timelines.
 - b. Discuss roles and responsibilities, including around leadership and coordination.
2. Propose Long List of Options
 - a. Contribute to the development of the Long List of Options.
 - b. Joint Technical Working Group Meeting to agree on Long List of Options to propose for consideration by the Steering Committee. It is envisaged that this process will consist of a 1 day workshop, where the Joint Technical Working Group works through and proposes options for consideration by the Independent Review Panel through the middle part of the day. The Independent Review Panel will then provide feedback to the Joint Technical Working Group, who will then finalise its proposals.
3. Develop Scope of Work
 - a. Develop Scope of Work for the Technical Packages.
 - b. Recommend Scope of Work (for the Technical Packages) to provide to the Independent Review Panel for ratification, prior to consideration by the Steering Committee.

4. Propose Short List of Options
 - a. Contribute to the characterisation of the Long List of Options, as relevant to the Technical area of interest.
 - b. Joint Technical Working Group Meeting to work through and agree on Short List of Options to propose for consideration by the Steering Committee. It is envisaged that this process will consist of a 1 day workshop, where the Joint Technical Working Group works through and proposes options for consideration by the Independent Review Panel through the middle part of the day. The Independent Review Panel will then provide feedback to the Joint Technical Working Group, who will then finalise its proposals.
5. Regular Technical Working Group meetings
 - a. The Technical Working Group will meet fortnightly.
 - b. A standard agenda structure will be developed and agreed.
 - c. The Technical Team will report on current progress and present areas that require Technical Working Group input or consideration.
 - d. The Technical Working Group will consider any key risks or project priorities.
 - e. The Technical Working Group will review project outputs and make proposals, recommendations or endorse reports for release to the Independent Review Panel for ratification prior to consideration by the Steering Committee.
6. Strategies and Options
 - a. Joint Technical Working Group Meeting to discuss outputs from Technical Packages or Reports.
 - b. Joint TWG to agree on strategies and options to propose for consideration by the Steering Committee. It is envisaged that this process will consist of a 1 day workshop, where the Joint Technical Working Group works through and proposes options for consideration by the Independent Review Panel through the middle part of the day. The Independent Review Panel will then provide feedback to the Joint Technical Working Group, who will then finalise its proposals.
7. Interaction with Steering Committee
 - a. The Technical Working Group Chair is to provide progress report, matters for Decision or Note and endorsed Project reports to the Steering Committee.
 - b. Where required, Technical Working Group Chairs and the Technical Team leader will attend Steering Committee meetings to present on progress or assist in Steering Committee deliberations.

8. Interaction with Technical Team

- a. The Technical Working Group Chair will provide the primary point of contact for the Technical Team.
- b. The Technical Working Group will track the progress of the Technical Team and Project Package against key project deliverables or milestones and provide feedback to the Technical Team if there are any potential risks or concerns.

A depiction of the integrated assessment process (as described above) is given in Figure 2-5.



■ Figure 2-5 Integrated Assessment Process

Information Sharing between Technical Working Groups

The Study's success depends upon complete cooperation and information-sharing between the Technical Working Groups. The existing and already well-established relationships between the agencies involved would support this occurring.

The following critical information flows between the Technical Working Groups are also required to ensure the Study's success:

- The Water Supply Security Technical Working Group would need to advise the Flood Management and Control Technical Working Group on the potential logical options for dam Full Supply Levels to allow the flood mitigation benefits and impacts of these options to be properly investigated.
- The Flood Management and Control Technical Working Group would need to advise the Floodplain Development and Risk Management Technical Working Group on the benefits and impacts of the many possible options for managing the dams' flood mitigation storage volumes.

These processes will allow all Groups to give appropriate consideration as to how the selection of individual options for managing the dams during flood events will impact South East Queensland communities.

Given the current strong working relationships between many likely members of the Technical Working Groups, there is a high expectation the Committees would generally interact in a highly-productive and effective manner.

Additionally it is proposed that cooperation and information-sharing between the Technical Working Groups could be facilitated by:

- Joint Technical Working Group meetings as and when required. It is particularly envisaged that this will be necessary to integrate the outcomes from the individual Technical Working Groups and provide a consolidated view on nominated options for Steering Committee consideration.
- Development and application of a standardised economic assessment framework and multi-criteria analysis for the evaluation of options within the Technical Working Groups.
- The Integration Forum.

Membership

The suggested membership of each of the Technical Working Groups is outlined in the table below. Each Technical Working Group will be chaired by a representative of the lead organisation.

Table 2-1 Proposed Technical Working Group Membership

Floodplain Risk Management Assessment	Flood Control / Management Options Study	Water Supply Security Assessment
Group Lead DLGP	Group Lead Seqwater	Group Lead QWC
Group Members BCC (Lead for study activities specifically relating to Brisbane City) ICC (Lead for study activities specifically relating to Ipswich City) SRC (Lead for study activities specifically relating to Somerset Region) DTMR DERM DCS (EMQ) QRA	Group Members DERM BoM BCC ICC SRC QWC	Group Members DERM SEQ WGM Seqwater LinkWater

Members appointed to the Technical Working Groups should demonstrate the following key attributes:

- Ability to work positively with the full range of individuals and groups involved in the project.
- Strong skills in project delivery and collaboration.
- Necessary seniority to be able to take the responsibilities required of the role.
- Understanding of the wider objectives of the project and how the given Technical Package fits into the overall project process and outcomes.
- Good understanding of the technical requirements and complexities of the given Technical Package.

2.6.6. Integration Forum

The Integration Forum will both act as a sub-Committee of the Steering Committee and comprise the Chairs of all Working Groups. It will be facilitated by the Project Management Team.

The Integration Forum will focus on integration of the study components, through the following activities:

- developing the integrated options analysis framework and oversight of any associated consultancy
- developing cross group strategies
- providing a forum to discuss and work through cross group issues

The Integration Forum is intended to focus upon integration considerations of issues raised by the Steering Committee, any Technical Working Group Chair, the Independent Review Panel or the Project Management Team.

To be clear, the Integration Forum will not take away any of the responsibilities or workflows and processes of either the Steering Committee or the Technical Working Groups. All Technical Working Groups will still report to the full Steering Committee. These responsibilities and workflows are described elsewhere in this document.

There should be the flexibility for the various parts of the governance structure to raise issues or matters for the consideration of the Integration Forum. However, in the case of any disagreement, the Steering Committee will be the ultimate determiner as to whether an issue or consideration falls within the scope of the Integration Forum. Likewise, the Steering Committee will be the ultimate body to resolve any integration issues which cannot be resolved at this level.

Responsibilities

- Development of the integrated options analysis framework and oversight of any associated consultancy
- Provides a forum to address integration matters raised through the Steering Committee, Technical Working Groups, Independent Review Panel or Project Management Team
- Facilitates Technical Working Groups' communication and 'work-through' around integration matters.
- Develops cross Working Group strategies, where appropriate
- Take a 'bigger picture' perspective (including around benefits and impacts), as compared to focusing upon one technical work stream only

Work flows and processes

The Integration Forum will have the flexibility to meet, as required, around specific integration issues, and in a meeting format (eg meeting or workshop) to again be determined with flexibility.

As an integration issue or matter arises, the Project Management Team will communicate with all members of the Steering Committee and the Chairs of the Working Groups, to seek their interest in attending the Integration Forum to deal with that topic. All potential Integration Forum members are to have discretion as to whether they attend, if it is clear the consideration has no/little relevance to their area of focus/interest.

There is also discretion for the Chairs of the Working Groups to invite other members of their Working Group (or technical advisors/consultants) to a Forum, if they deem appropriate. Prior notice should be given to the Project Management Team.

As the facilitator, the Project Management Team will issue the meeting invitations and agenda for the meeting to all members of the Integration Forum and will keep a record of agreed Decisions and Actions. Beyond this, minutes of meetings will not be produced.

Membership

The Integration Forum is proposed to consist of the following members:

- Project Management Team (Facilitator)
- Sub-committee members of the Steering Committee (as self-nominated for each issue)
- Chairs of each of the four Working Groups
- Working Group members (or technical support consultants), by invitation

2.6.7. Communications and Engagement Working Group

The Communications and Engagement Working Group will be established to oversee communication activities and seek consistency in approach and messages.

Responsibilities

Responsibilities of the Communications and Engagement Working Group include:

- Accountable for leading and managing the coordination of any Communications messages or materials, relating to the Study.
- Engage and manage any support services.
- Develop the Scope of Work for the Community and Engagement function, including approach to community information, consultation and engagement.

- Propose matters for Decision or Note for the consideration of the Steering Committee.
- Manage and resolving any communication risks and other issues that may arise.

Responsibilities of the lead organisation for the Communications and Engagement Working Group include chairing and coordinating involvement of the Communications and Engagement Working Group and providing oversight to all activities. Where any organisation within the Working Group engages a study activity, that organisation shall be responsible for ensuring that key project deliverables are meeting the required outcomes and timeline.

Work flows and processes

The following summaries the key processes for the Communications and Engagement Working Group.

1. Initial Communications and Engagement Working Group meeting to:
 - a. Outline the project, governance framework, key deliverables and timelines.
 - b. Discuss roles and responsibilities, including around leadership and coordination.
2. Develop Communications Plan
 - a. Develop an overall Communications Plan for the Study.
 - b. Enunciate roles and responsibilities within the Communications Plan, particularly as they apply to each Local Government area and as supported by the State.
 - c. Develop consistent key messages, as required
3. Develop Scope of Work
 - a. Develop Scope of Work for the community information, consultation and engagement approaches.
 - b. Recommend Scope of Work for consideration by the Steering Committee.
4. Regular Communications and Engagement Working Group meetings
 - a. The Communications and Engagement Working Group will meet fortnightly (this duration may be modified, as required, to meet needs at the time).
 - b. A standard agenda structure will be developed and agreed.
 - c. Any major service provider will report on current progress and present areas that require Communications and Engagement Working Group input or consideration.
 - d. The Communications and Engagement Working Group will consider any key risks or project priorities.
 - e. The Communications and Engagement Working Group will review project outputs and make proposals, recommendations or endorse reports for consideration by the Steering Committee.

5. Interaction with Steering Committee
 - a. The Communications and Engagement Working Group Chair is to provide progress report, matters for Decision or Note and endorsed Project reports to the Steering Committee.
 - b. Where required, the Communications and Engagement Working Group Chair and activity leader will attend Steering Committee meetings to present on progress or assist in Steering Committee deliberations.
6. Interaction with service providers
 - a. The engaging authority will provide the primary point of contact for the service provider.
 - b. The Communications and Engagement Working Group will track the progress of the service providers against key project deliverables or milestones and provide feedback to the service providers if there are any potential risks or concerns.

Membership

The Communications and Engagement Working Group membership is proposed to representatives from the following organisations:

- SEQ Water Grid Manager (WGM) (Chair).
- Brisbane City Council (BCC) – Lead for activities specifically relating to/within Brisbane City.
- Ipswich City Council (ICC) – Lead for activities specifically relating to/within Ipswich City.
- Somerset Regional Council (SRC) – Lead for activities specifically relating to/within Somerset Region.
- Seqwater.
- Queensland Water Commission (QWC).
- Department of Environment and Resource Management (DERM).
- Department of Community Safety (DCS (EMQ))
- Department of Local Government and Planning (DLGP).

2.6.8. Stakeholder Reference Group

The stakeholder reference group (SRG) will be a forum for the nominated stakeholders to provide input to the optimisation study and be informed about the progress of the Study. The group will represent a cross-section of the community to identify issues and opportunities associated with the Study.

The SRG will:

- Provide a forum for discussion and exchange of information on topics related to the Study
- Assist the Steering Committee to identify community concerns and ideas regarding the Study

- Provide a transparent, representative and accessible forum to address issues of community interest related to the Study
- Provide the Steering Committee with a source of community feedback in considering options, benefits and impacts
- Provide the Steering Committee with an indicator to gauge community perception and understanding of the project
- Act as a conduit between the Steering Committee and the local community by communicating accurate, timely and balanced information about the Study's status and outcomes.

The SRG will not be a decision-making body. The Steering Committee will note, consider and report on the views and ideas of the SRG. The SRG is part of the broader consultation program that will support the Study. The scope of the SRG will be subject to change and will be discussed with the members throughout the period of engagement.

The terms of reference for the SRG detailing its aims, scope, structure and operational guidelines is provided in **Appendix H**.

2.6.9. Project Management Team

The Project Management Team is responsible for the project management of the project, ensuring that the various Technical Packages and Technical Working Groups are both coordinated and integrated and have a common vision and understanding of project outcomes, timelines and deliverables.

Responsibilities

- Report to the Chair of the Steering Committee.
- Development of the overarching Project Plan for the Project including identification of:
 - Deliverables and associated timeframes.
 - Interactions, work processes and approvals between the Steering Committee, Independent Review Panel, Integration Forum and Technical Working Groups.
- Work with the Chairs of the Steering Committee and Technical Working Groups to develop Scope of Works and delineation of roles and responsibilities.
- Develop and manage the project budget, source funding and fund control/approval limits.
- Facilitate the resolution of technical issues that arise between the Technical Working Groups.
- Supervise and manage the project to ensure that reports and other deliverables are delivered in a timely and cost effective manner, particularly from the Technical Working Groups.
- Attend meetings, and liaise with, senior representatives of the Stakeholder organisations.

- Provide administrative support to Committees including organising meetings, agendas and minutes etc.
- Liaise with Seqwater's or other owner/leader organisation's procurement team to assist in engaging consultants for the project.
- Manage progress payment control for consultants, as required.
- Develop and manage system/data portal for management of data generated by the Project.
- Develop protocols for distribution of data, both internally and externally.
- Undertake Project Status reporting including preparing reports against project plan milestones and budget.
- Undertake risk identification and management through the development of a risk register.

Work flows and processes

The following summaries the key processes for the Project Management Team.

- Organise various meetings including times, agendas and minutes
- Provide report templates and document standards and ensure consistency across report deliverables.
- Receive submissions from the Technical Working Groups.
- Monitor submissions to ensure they meet requirements and template.
- Ensure submissions are received on time.
- Deliver submissions to either the Steering Committee or Independent Review Panel.
- Integrate processes and packages from each of the Technical Working Groups to ensure cohesive submissions to the Steering Committee.
- Facilitate feedback from the Steering Committee and Independent Review Panel to the Technical Working Groups

Project Management Team structure

The Project Management Team will generally consist of three people, with miscellaneous support (eg. scheduling), as agreed. The team will include a nominated Project Manager, Deputy Project Manager and JIC Project Manager. Senior member of the team are to have skills not only in the delivery of major studies, but also across the various areas of Technical work to be considered in this Study.

2.7. Governance Structure Contact Details

A schedule of contact details for all members of the Governance structure will be developed, then issued to all members and progressively updated, as required. The updated version is included in **Appendix D**.

3. Outline of Study and Scope of Work

3.1. Possible Outline of Study

A possible outline of the WSDOS is set out in Figure 3.1 and below (while the scope and activities for the balance of 2011 will be able to be defined initially in reasonable detail, the scope and timelines beyond 2011 will depend upon the detailed Scope of Work agreed for each component of the study):

- Establishment of the project Governance structure and representation (Aug 2011);
- Optimisation Study Progress Report No 1 – For submission to QFCI (Dec 2011);
- Optimisation Study Report and nomination of options through Government submission/s – 2012.

Implementation and other activities will occur following any Government decision making and will not be part of the scope of this Study.

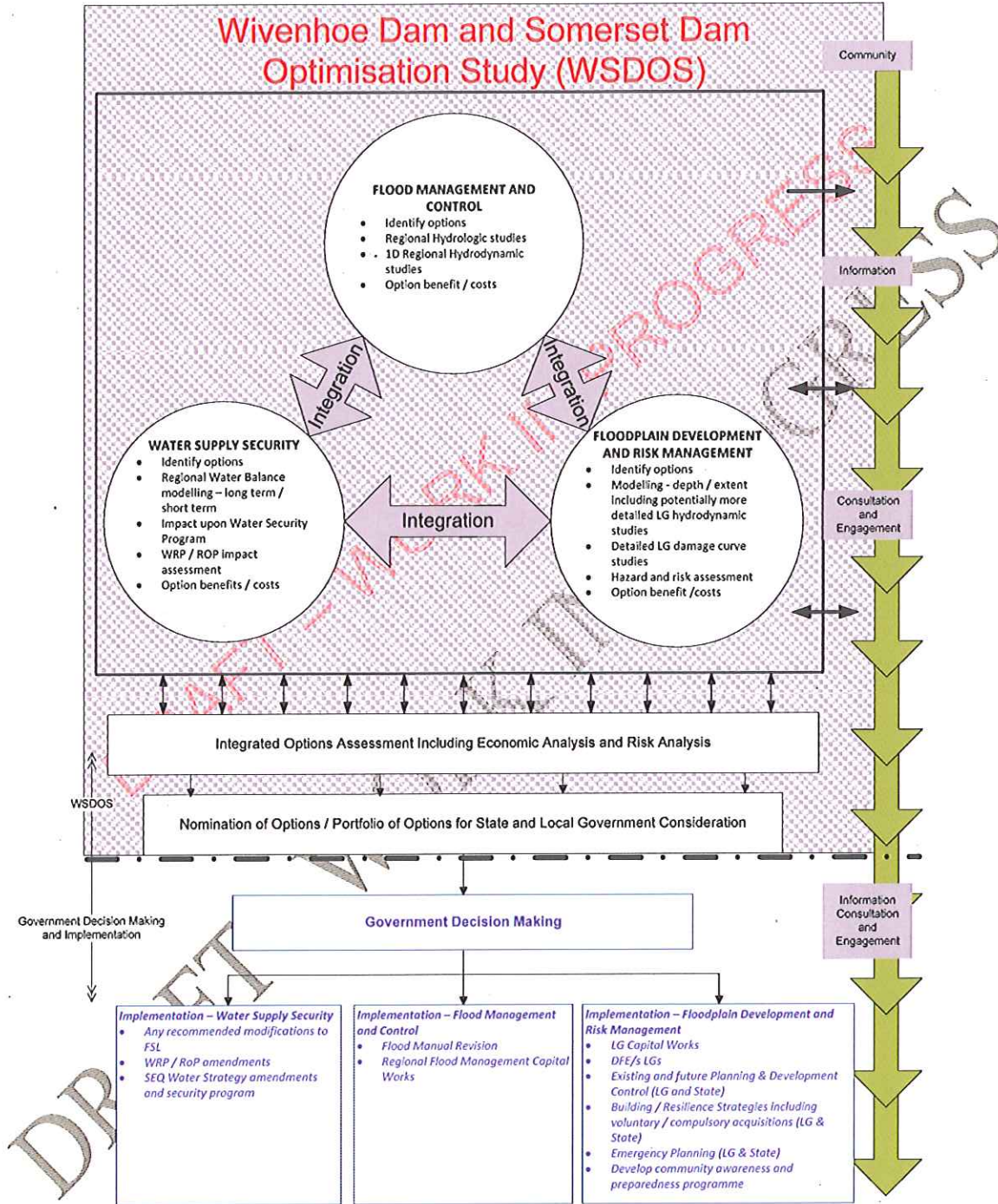
3.1.1. Establishment of the Project Governance

The proposed governance structure of the study includes a Steering Committee, Independent (Expert) Review Panel and Technical Working Groups which will oversee the studies, including for flood management and control options study as well as floodplain management, water supply security and economic assessments.

Possible key activities and milestones are as follows:

- Table 3-1 Key activities and milestones – Project Establishment

Activities	Target Dates
Engage with organisations, Project Establishment Workshop and agree representation for Steering Committee	End July - Early August 2011
Steering Committee Meeting No 1	Mid August 2011
Independent Review Panel Meeting No 1	TBA
Technical Working Groups first meetings	Late August 2011



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■ Figure 3-3-1 Draft Study Overview

3.1.2. Optimisation Study Progress Report No 1 (Dec 2011)

The Optimisation Study Progress Report No 1, which will be submitted to QFCI, will contain the detailed investigation process endorsed by the Project Steering Committee for the investigation of the optimisation of the operation of the Wivenhoe and Somerset Dam system for both water supply and flood mitigation. The Report will also outline the scope of work required to fully assess all considerations, consistent with the process of investigation.

The agreement of the detailed Scope of Work will be dependent upon the full participation of all members identified in the governance structure.

Possible key activities and milestones are outlined below:

- **Table 3-2 Key activities and milestones – For Progress Report submission to QFCI by end 2011**

Activities	Target Dates
Develop initial Options Analysis Framework (Including objectives and criteria setting, economic and financial analysis and risk management approach)	August – October 2011
Develop Initial Long List of Options	September - October 2011
Prepare detailed Scope of Work – Flood Management/Control Options Study, Water Supply Security Options Study, Floodplain Management Assessment, Economics/Financial Assessment	September – November 2011
Develop approach to Community engagement	October – November 2011
Develop approach to management of residual risks (and potential scope of associated planning activities by others)	October - November 2011
Progress Report No 1	December 2011

3.1.3. Optimisation Study Report and Government submissions (2012)

The Optimisation Study Report will outline the investigation, assessment and evaluation of options, resulting in the nomination of options or scenarios for Government consideration (including consideration of roles and responsibilities for governance, delivery and monitoring). The process will involve consultation with the community and is likely to provide the basis for review of the flood operations manual and updated flood emergency planning, consistent with the nominated options. The

considerations will also extend to assessing the impacts upon and potential amendments required to State and Local Government planning instruments and policies.

Possible key activities are outlined below:

Possible Governance structure driven activities:

- Undertake Short-Listing of Options through qualitative or conceptual level quantitative approaches, including supported by first pass risk assessment
- Full technical assessment and review of Short-List options including options costing, development of flood flows/heights for large range of events, flood extents and flood maps, stage damage curves
- Planning and operational modelling approach improvements, in accordance with the agreed Scope of Work, including physical survey work, where agreed
- Flood operations approach development
- Developing consistency in approach to community consultation including broad positioning/communication regarding flood hazard and risk and possible options to mitigate or reduce the risk, understanding of acceptable levels of risk and affordability through feedback
- Financial and economic analysis, including supporting studies and capture of further physical data (eg building floor levels) and economic/social/environmental data
- Option risk assessment updated
- Option evaluation and assessment, followed by nomination of options or a portfolio of options for Government consideration and decision, regarding:
 - Structural flood mitigation works
 - Non-structural (existing and future land use policies)
 - Development and building controls
 - Defined flood event
 - Understanding of residual risk
- Optimisation Study Report
- Full Flood Manual Review (note: following Government decision)

As possible parallel processes – to be driven by others

- Agencies/entities to drive community consultation, consistent with the agreed approach, in their areas of responsibility
- Hazard and Vulnerability Analyses (to support flood emergency planning update)
- Impact review upon State & Local Government planning policies and instruments
- Impact review upon Moreton ROP and ROL's, SEQ Water Supply Strategy
- First cut of updated State and other stakeholder Flood Emergency Plan/s prepared

3.2. Implementation

Implementation of options (or portfolio of options) will follow Government decision making and is not part of the scope of this Study.

As a guide, future activities could include:

- Detailed design, costing and scheduling of structural options
- Continued community engagement
- Refinement and/or development of necessary supporting planning policies and instruments (State and Local Government) and building code amendments
- Model upgrades finalised to the agreed framework or desired status (hydrologic, hydrodynamic, rainfall integration and real-time modelling capability)
- Floodplain hazard and detailed risk management plans completed (part of new overall Floodplain Management Plans), relevant to all Local Government areas
- State and other stakeholder Flood Emergency Plan/s completed, including roles and responsibilities
- Moreton ROP amended and ROL's, strategy integrated into SEQ Water Supply Strategy, all as appropriate to the outcomes of the study
- Implementation Plan developed and implemented (including education) including monitoring processes and any ongoing data collection

3.3. Study Scope of Work

It is proposed that the overall Study scope of work will consist of the following components:

- QFCI recommendations 2.10 to 2.13
- Options Identification
- Flood Control/Management Options Study
- Floodplain Risk Management Assessment (but limiting floodplain management options to key/strategic options/drivers)
- Water Supply Security Assessment
- Integration & Economics Assessment
- Options Evaluation and Selection
- Communications and Engagement

It is proposed that the following is out of the Study scope of work:

- Other QFCI recommendations
- Rapid assessment of Wivenhoe Dam Raising

- Flood Manual Revision
- Local scale or waterway/creek system floodplain management/mitigation options
- Legislative amendments, ROP, revisions to planning instruments
- Building code amendments
- Government decision on preferred option/s
- Implementation

While a number of the components within the Study will each have their own scope of work, it is critical that close integration occurs between all components. Examples of this include:

- the economics assessment will integrate closely with each of the technical study areas in terms of outputs/inputs.
- certain flood control/management options will clearly impact upon water supply security considerations, but at the same time storage performance (reservoir drawdown curves) will feed back to the hydrological modelling.
- the interface between the outputs of the hydrodynamic modelling of options in terms of flows and flood levels with the floodplain management considerations of flood extent and corresponding hazard/risks.

This approach to considering flood management options along-side floodplain management and water supply security is not new. In the United States, Integrated Resource Planning is already undertaken, which encompasses not only least-cost planning (which focuses upon balancing water supply and demand options), but integrates also with local and regional planning, flood and floodplain management, catchment management, water quality and recreation considerations.

It is also noted, while the study will have a focus upon possible options associated with Wivenhoe and Somerset Dams, it is likely other options will be identified for assessment that are not directly related to these assets. In floodplain risk management studies, management measures are normally categorised as follows:

- Structural measures – eg. new or upgraded dam structures, levees, detention basins
- Non-structural measures – eg. changes to operations
- Development and building control measures – eg. types of construction, raised dwellings, location and configuration of development, land use planning (existing and future development and uses)
- Flood emergency planning – recognising that there will always be a residual flood risk and undertaking rigorous emergency and response planning

The optimisation study will focus upon options primarily associated with the first two measures outlined above, but noting the Floodplain Risk Management Group will have the ability to identify strategic floodplain management options to be considered along-side the flood control and water security options. It is also possible that work may be undertaken to update aspects relating to the latter measure by others in parallel, and be informed by the Study (but not included in the scope). An example of this would be an updated Hazard and Vulnerability Analysis, undertaken in conjunction with the investigation of short-list options and would be used as the basis for updating any existing Flood Emergency Plans.

An indicative outline of the scope of work for each of the study components has been provided in Appendix A. It is noted that this is preliminary only (to give a high-level understanding of scope) and that detailed scoping will occur around each of these components, including interaction with key Study members and stakeholders through the various Groups, to develop a final Scope of Works for each of the Technical Packages, that will be endorsed by the Steering Committee.

There will also be many other bodies of work which will arise as a result of the study considerations (delivered by others in parallel or following).

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4. Risk Management

4.1. Risk Management

Risk will be managed in accordance with the relevant Australian Standards. A risk management plan is being developed for the study and has been included in **Appendix B**.

The Study Risk Management Plan will be reviewed by the Steering Committee once established. The risk management plan will be a live document and will be reviewed quarterly.

The risk management plan will incorporate:

- a methodology for risk assessment, control and monitoring;
- a risk register to identify study specific risks;
- plans to mitigate and monitor specific risks; and
- a framework for incorporating risk assessment into key decision making and planning processes for the study.

4.2. HSEC Management

It is the vision of the study to demonstrate passion and commitment to workplace wellness and safety through adoption of safe practices, innovation and leadership. HSEC risks will be effectively managed for any work to be undertaken for the study, recognising the legal obligations for work undertaken in Queensland.

It is recognised that a significant number of organisations will be involved in the study, each with their own HSEC policies and procedures. Each organisation undertaking work on the study is responsible for managing HSEC for any work undertaken by their personnel for the study.

As a minimum, a risk register and Job Safety and Environment Analysis (JSEA) or similar will be undertaken prior to any out of office work. An example is provided in **Appendix C**. In addition to this, if it is necessary to access another member's or stakeholder's site (i.e. a Steering Committee visit to Wivenhoe Dam) all personnel are to be escorted and follow the site procedures.

All organisations are responsible for ensuring HSEC practices are completed and auditing HSEC practices for any work undertaken for the study.

The Project Management Team will not be responsible for monitoring, auditing or reporting on HSEC compliance for the study.

5. Study Schedule

A high level schedule (**Figure 5-1**) has been prepared based on the outline of the study and scope of work detailed in **Section 3**.

The schedule identifies three phases of project delivery:

- Establishment of the project Governance structure and representation (Aug 2011);
- Optimisation Study Progress Report No 1 – For submission to QFCI (Dec 2011);
- Optimisation Study Report and nomination of options through Government submission/s – 2012.

The scope of activities in the first two phases of the study has been scheduled to complete the associated works in the balance of 2011. The schedule for completion of the study work beyond 2011 will depend upon the detailed Scope of Work agreed for each component of the study.

Implementation and other activities will occur following any Government decision making and will not be part of the scope of this Study.

This schedule will be updated as the overall scope of the project becomes better defined and detailed schedules are prepared for each of these components.

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ID	Task Name	Duration	Start	Finish	Qtr 3, 2011	Qtr 4, 2011	Qtr 1, 2012	Qtr 2, 2012	Qtr 3, 2012	Qtr 4, 2012	
					Jul	Aug	Sep	Oct	Nov	Dec	
1	Project Governance Establishment	16 days	Fri 5/08/11	Fri 26/08/11							
2	Steering Committee Establishment Workshop	1 day	Fri 5/08/11	Fri 5/08/11							
3	Independent review panel establishment	15 days	Mon 8/08/11	Fri 26/08/11							
4	Technical working groups establishment	15 days	Mon 8/08/11	Fri 26/08/11							
5	Optimisation Study Progress Report No. 1	100 days	Mon 8/08/11	Fri 23/12/11							
6	Develop initial Options Analysis Framework	30 days	Mon 8/08/11	Fri 16/09/11							
7	Develop initial long list of options	30 days	Mon 19/09/11	Fri 28/10/11							
8	Develop detailed scope of work	63 days	Mon 5/09/11	Wed 30/11/11							
9	Develop approach to community engagement	43 days	Mon 3/10/11	Wed 30/11/11							
10	Develop approach to management of residual risks	43 days	Mon 3/10/11	Wed 30/11/11							
11	Progress report No. 1	17 days	Thu 1/12/11	Fri 23/12/11							
12	Optimisation Study Report	240 days	Mon 9/01/12	Fri 7/12/12							
13	Undertake short listing of options	20 days	Mon 9/01/12	Fri 3/02/12							
14	Technical assessment and review of short list options	100 days	Mon 6/02/12	Fri 22/06/12							
15	Community consultation	120 days	Mon 6/02/12	Fri 20/07/12							
16	Financial and economic analysis	60 days	Mon 25/06/12	Fri 14/09/12							
17	Options evaluation and selection of preferred options / scenarios	40 days	Mon 17/09/12	Fri 9/11/12							
18	Optimisation Study report	20 days	Mon 12/11/12	Fri 7/12/12							

WSDOS Overview Schedule
Date: Thu 18/08/11

	Task		Milestone		External Tasks
	Split		Summary		External Milestone
	Progress		Project Summary		Deadline

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6. Communications Plan

A detailed project communications plan will be developed that sets out the communication strategies and processes required to engage and consult with the broad range of stakeholders that will have an interest in the project. The plan will need to address communications between a wide cross-section of stakeholders ranging from partners/members involved in the delivery of the project, to external agencies, industry groups and the general public.

The plan should contain several communications programs developed especially to effectively engage specific stakeholder groups. The following communications programs should be considered:

- Project Management Team - Project Sponsor (Seqwater) Communications Program
- Governance Structure Communications Program
- Community Consultation program

The plan will include both reporting and communication protocols.

As Project Sponsor, Seqwater has been requested to provide formal reporting on the study to the Queensland Floods Commission of Inquiry (QFCI) and the Minister for Energy and Water Utilities. Table 6-1 presents the current study reporting protocols.

■ Table 6-1 Reporting Protocols

Reporting To	Timing	Protocol / Response	Responsibility
1) QFCI	Periodic (medium term)	As required	Project Sponsor (Seqwater)
2) Minister	Monthly (Medium term)	Sign off Responsibility defined Assume could be tabled in the QFCI	Project Sponsor (Seqwater)

The project communications plan will develop over time and will need to be updated as the study progresses through different phases. Initially, the Communications Plan will be developed considering the existing communications protocols of the Project Sponsor (Seqwater) and other project delivery members.

Interim protocols pertaining to the establishment phase of the project have been developed and are summarised in **Table 6-2**.

■ **Table 6-2 Interim Communications Protocols**

Activity	Timing	Protocol / Response	Responsibility
1) Establishment of Steering Committee (letter)	July 2011 (Short term)	Seqwater leading/facilitating the process Steering Committee being established Communications Plan to then be established	Project Sponsor (Seqwater). (No unapproved communications in interim)
2) Steering Committee effectively operating	Sep/ Oct 2011	Endorsed Communications Plan	As per the Communications plan
3) Advice to QFCI	December 2011	Long list of Options Scope of work	As per the Communications plan
4) Community Consultation	2012 onwards	As per the Communications plan	As per the Communications plan

Once developed, the Project Communications Plan will become **Appendix D**. The Communications Plan will be updated, as required, to account for any change to circumstances or details.

7. Procurement and Contractor Management

7.1. Procurement Arrangements and Responsibility

With the large number of Study members and stakeholders involved in the study with diverse statutory responsibilities and technical expertise, it is recognised that there may be multiple commissioning organisations and contracted parties for certain aspects of the study.

Formal arrangements for funding and commissioning activities related to the study will be developed once the Steering Committee is established. The following principles should be included in these arrangements and should be used in the interim prior to arrangements being formalised.

7.2. Role of Project Management Team

The Project Management Team will be involved in the commissioning of all contractors who will work on the study. The Project Management Team's responsibility will be to monitor consistency with the defined scope, terms and conditions and confidentiality provisions. On commissioning, the Project Management Team will provide the contractor with an overview of the document control system, quality management requirements and communications plan, as well as safety management expectations.

The Project Management Team, via the document control system, will be responsible for documenting quality control of contractor deliverables (as per the Quality Management Plan) and the monitoring and distribution of contractor deliverables to other parties via the document control system.

All other management of the contractor remains the sole responsibility of the commissioning organisation.

7.3. Terms and Conditions

All contracted (or sub-contracted) organisations are to be engaged under and agree to consistent Terms and Conditions.

The key aspects of the terms and conditions that should be consistent are:

- Confidentiality provisions
- Intellectual property provisions

7.4. Confidentiality Agreements

It is noted that as part of this Project, parties may become aware of information that is of a confidential nature to one or more of the Study members or stakeholders involved. All personnel providing

services to the study are to sign a Confidentiality Agreement, consistent with the example form provided (refer **Appendix E**). This is to include members of the Independent Review Panel, Project Management Team and Technical Teams.

7.5. Security of Confidential Information

Project related information (both electronic and hard copy) shall be kept secure at all times. Access to electronic information shall be limited to those who have signed the confidentiality agreement.

7.6. Intellectual Property

Data produced as part of this study will need to be used by various stakeholder members in the future to implement the outcomes of the study. For this reason, the following protocols should be implemented relevant to Intellectual Property.

Intellectual Property of all data, models, documents, etc produced as part of the study must vest in one of the stakeholder organisations represented on the Steering Committee. In addition, terms and conditions of the contract must allow for a license to copy, use, modify or distribute the data so as to be available to all stakeholder members of the study.

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8. Document Control

8.1. Processes

Documents and data will be managed by the Project Management Team, through a study specific document control system.

The document control system will be used to distribute and track background reports, working documents, data, Quality Assurance forms and Progress Reports.

It will need to provide the following functionality:

- Ability to load versions of reports/data to the system (all users) with administrative ability to then approve documents before they are visible/ accessible to other parties
- Ability to transmit reports/data to user groups for review / approval
- Ability to track document versions and approval processes
- Ability to provide differing levels of security on some documents and make some documents visible to only some parties
- Ability to store and move large files (modelling data).

It is anticipated the following User Groups will be set up within the document control system:

- Project Management team (system administrator)
- Steering Committee members
- Independent Review Panel members
- Technical Working Groups members (x3)
- Technical teams (various consultants)

8.2. Document Versions, Numbering and Naming

A document naming and numbering protocol will be developed once the document control system is established to provide consistency across all documents produced by all members.

8.3. Data Management

Data transfer will be undertaken using the document control system. Specific protocols will need to be developed for data produced by or used in specialist software, such as GIS data. These will be developed in consultation with the relevant members, creators and end-users.

8.4. Study Reporting

8.4.1. Monthly Reporting

Monthly study progress reports will be produced by each Technical Working Group and submitted to the Project Management Team via the document control system.

The Project Management Team will collate these reports into a monthly report which will be submitted to the Project Sponsor and Steering Committee.

A template will be developed for the monthly report in consultation with the Steering Committee and Technical Working Groups. The template can be found in **Appendix F**. It is expected that the contents of each Report will provide an overview of Study progress and will contain the following items, as a minimum:

- Executive Summary (in the form of a dashboard);
- Emerging issues/risks;
- Work undertaken, including activity or deliverable progress;
- Schedule tracking;
- Cost tracking;
- Communication;
- Any matters for Steering Committee Decision or Noting.

8.4.2. Weekly Reporting

Weekly project reports will be prepared and tabled at the weekly Project Management Team meeting with the Project Sponsor. The contents of the weekly status report are designed to be simple and will address:

- Short project summary status, using a traffic light indicator (on track, emerging issues, action required);
- Key activities completed during the week;
- Key activities planned for the upcoming week; and
- Key project risks.

8.5. Meetings

There will be a substantial number of meetings between the Project Management Team, Technical Working Groups, Steering Committee and other organisations such as consultants, during the course of this project.

8.5.1. Project Management Team

The Project Management Team will provide the secretariat for the study. A member of the Project Management Team is to be invited to and attend all formal meetings for the study. It is the meeting chair's responsibility to ensure the Project Management Team is invited.

8.5.2. Agenda

The meeting chair will provide the agenda to the Project Management team at least 24 hours prior to the scheduled meeting time. The Project Management Team will then distribute the meeting agenda to all participants via the document management system.

8.5.3. Minutes/ Actions Register

A member of the Project Management Team will coordinate the recording of meeting minutes or development of an actions/decisions register (as agreed prior to the meeting). The Project Management Team will then distribute these to all attendees, as appropriate, through the document control system to check for accuracy and once confirmed distribute the final copy.

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9. Quality Management

9.1. Quality Management Plan

Quality management of the study will be undertaken in accordance with ISO9001 or an equivalent standard acceptable to the Queensland Government.

A comprehensive Quality Management Plan will be developed for the study to clearly delineate responsibilities for Quality Management across the appropriate Study members. Once developed, this will become **Appendix G**.

9.2. Responsibility for Quality Reviews

All parties undertaking technical work, producing documents or reviewing work will be responsible for Quality Assurance and will be certified as ISO9001 accredited (or equivalent standard acceptable to the Queensland Government). All parties responsible for Quality Assurance must plan for (nature, timing and by who) and document quality reviews that are undertaken and complete appropriate auditing to maintain accreditation.

The Project Management Team is not responsible for undertaking quality reviews of submitted documents, checking that document reviews actually occurred or auditing stakeholder quality assurance systems. This is the responsibility of the submitting party.

All technical documents and data produced as part of this Project must be reviewed by an appropriately qualified Technical Reviewer within the producing organisation prior to submission to the Project Management Team. The nominated Technical Reviewer must not be an author of the document to be reviewed. This system will be referred to as the practice review system.

Documentation of the practice review must be submitted to the Project Management Team with the deliverable and noted within the document history.

9.3. Documentation of Quality Reviews

The Project Management Team is responsible for documenting the Quality Assurance reviews that have been undertaken. Regular reviews of the PM function will also be undertaken and documented.

All deliverables / documents submitted to the Project Management Team will require an attached Quality Assurance declaration to document reviews undertaken. A template for this declaration will be included in the Quality Management Plan.



Appendix A Scope of Work – Indicative Only

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An indicative outline of the scope of work for each of the study components has been provided in the following sub-sections. It is noted that this is preliminary only (to give a basic understanding of scope) and that detailed scoping will occur around each of these components, including interaction with key Study members and stakeholders through the various Groups, to develop a final Scope of Works for each of the Technical Packages, that will be endorsed by the Steering Committee.

There will also be many other bodies of work which will arise as a result of the study considerations (delivered by others in parallel or following).

Establishment of the Project Governance

A governance structure will be established to oversee the Study and to meet Recommendations 2.10 and 2.11 of the QFCI August 2011 Interim Report:

2.10 Seqwater should act immediately to establish:

1. a steering committee to oversee the long term review of the Wivenhoe manual including senior representatives of at least DERM, Seqwater, the Water Commission, the Water Grid Manager, Brisbane City Council, Ipswich City Council and Somerset Regional Council
2. a technical review committee comprised of independent experts in at least hydrology, meteorology and dam operations to examine all technical work completed as part of the review.

2.11 The steering committee should ensure the scientific investigations and modelling outlined in recommendation 2.12 and 2.13 are completed. It should also assess the need for any other work to be done, and instigate any other investigations or work considered necessary for a full and proper review of the Wivenhoe manual.

The proposed governance structure of the study includes a Steering Committee, Independent (Expert) Review Panel, Integration Forum and Technical Working Groups which will oversee the studies, including for flood management and control options study as well as floodplain management, water supply security and economic assessments.

Options Assessment

- Initially develop an Option Assessment Framework/Methodology through interaction with the Steering Committee. A number of study objectives will be developed during the initial Steering Committee meetings and an assessment framework then developed which will consider:
 - How options contribute to the achievement of these objectives
 - An economic assessment methodology
 - Impacts of options upon risks (likelihood and consequence)

Assessment criteria (financial, social, environmental, regulatory, risk reduction, technological diversity) will be determined during this phase.

- The Option Assessment Framework/Methodology will carry through the entire study, likely to be more qualitative or performance based in the initial sieving of options (long list to short list) and then utilising more detailed quantitative approaches in the assessment of the short list of options.

Options Identification

- Identify an initial long list of options – structural, operational, land use planning and control and policy.
- The identification of options will include research of flood management/control options already identified through the process of the Queensland Flood Commission of Inquiry, identification of other logical options relative to flood control or management, discussions with key stakeholder personnel and possible workshops.
- Develop the long list of options through each of the Technical Working Groups and then consider at a facilitated joint planning workshop, with the desired outcome being a proposed long list of options.
- Outline the characteristics of the long list of options against the defined objectives and selection criteria, as the basis for assessment to identify short-list of options.
- Develop the characterisation of the long list of options against the objectives and performance or selection criteria through each of the Technical Working Groups and then consider at a facilitated joint planning workshop, with the desired outcome being a proposed short list of options.

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Flood Control/Management Options Study

Overview

The Flood Management and Control Investigation would examine the benefits and impacts of the many possible options for managing the flood mitigation storage volumes of the dams, as well as new structural options.

For operational management of the storage options, options will be developed (including in a matrix style), which will investigate a range of variables, from different flow targets at Moggill, to greater protection of road/bridge crossings, to differing trigger and draw-down strategies.

Structural options can range, for example, from those which investigate modification (or raising) of the dams, through to new storages or detention basins located elsewhere.

Options Identification

- Assist in the development of the long list of options.
- Qualitatively assess the long list of options, relative to flood control/management, as part of a process to assist to identify a short-list of options. It is not envisaged that this would involve detailed modelling work, but instead would align with a risk management approach (i.e. a performance based or qualitative assessment of the potential of an option to reduce the frequency of flooding and/or associated consequences to the community).

Basis for Analysis including Modelling

- Review existing modelling approaches and agree approach to modelling to underpin the Study activities. This review will incorporate, but not be limited to Recommendation 2.12 of the QFCI August 2011 Interim Report:

2.12 The following scientific investigations should be carried out prior to modelling work under the supervision of the steering committee and reviewed by the technical review committee:

1. review of the design hydrology:
 - a. using a stochastic or Monte Carlo or probabilistic approach
 - b. taking into account observed variability in temporal and spatial patterns of rainfall
 - c. taking into account observed variability in relative timings of inflows from the dams and downstream tributaries.
2. production of a digital terrain model incorporating a bathymetric survey of all critical sections of creeks and rivers upstream and downstream of the dam relevant to flood modelling
3. assessment of the reliability of the 24 hour, the three day and the five day rainfall forecasts
4. consideration of whether and how weather radar can be incorporated into decision making

5. requesting information from the Bureau of Meteorology as to its willingness to provide ensemble forecasts
 6. consideration as to whether and how ensemble forecasts can be incorporated into decision making.
- Continue to improve the existing hydrologic and hydrodynamic flood models, as agreed by the Technical Working Group and Steering Committee. Refine design flood inputs and/or hydrologic approach, as appropriate to the overall study nature (investigation of many options) and timeframes.

Options Analysis

- Document flood flows and depths for the base case (existing conditions)
- Analyse short list of options using flood models. These analyses will incorporate, those identified in Recommendation 2.13 of the QFCI August 2011 Interim Report (see below), but will also be undertaken for the much broader set of short-list options:

2.13 The following modelling work should be carried out under the supervision of the steering committee and reviewed by the technical review committee:

1. modelling across the range of full supply levels, operating strategies and flood events (historical, design and synthetic) in each case assessing the consequences in terms of risk to life and safety and economic, social and environmental damage. In terms of operating strategies, using a full range of strategies including:
 - a. a stepped change from W3 to W4
 - b. moving to a higher rate of release earlier in W1
 - c. bypassing W1
 - d. altering maximum release rates under W3
 - e. operating the gates in conjunction with the initiation of any of the fuse plugs in order to achieve a lower rate of discharge
2. simulations to test the robustness of relying on the 24 hour, the three day and the five day rainfall forecasts
3. development of a probability distribution for the time between closely spaced flood peaks in the catchment using historical records.

- Identify range of expected outflows for any changed operation or hydrologic approach.
- Quantify changes to flooding behaviour, e.g. depth, duration of flooding, etc.
- Quantify changes to reservoir behaviour, e.g. management of water supply storage to achieve mitigation outcomes.

- Identify any other relevant aspects (eg. environmental, social) associated with each option.
- Assist in the quantification of flood hazard and risks (downstream) for full range of flood events, noting the Floodplain Risk Management study will be driving this overall task.

Outputs/Deliverables

- Scoping of option concepts.
- Analysis of options, as basis for comparison.
- Technical packages aligning with key deliverables.
- Draft and final technical reports.

Project Management and Interfaces

- Prepare a monthly project management report, in a format to be provided by the Project Management Team.
- Attend the Technical Working Group meetings.
- There is an expectation that regular interaction will occur with the organisations delivering the other two technical studies (Floodplain Risk Management assessment and Water Supply Security assessment), the economics assessment and the Technical Working Groups, Independent Review Panel and Steering Committee members, as required.

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Floodplain Risk Management Assessment

Overview

To properly assess the options determined in the Flood Management and Control Investigation, it is anticipated Local Authorities would lead study work to consider the potential impact of each dam management option upon local communities during flood events, including the potential impact each option would have on flood standards for local authority planning and development. Implementing a new dam management option has the potential to impact existing and new residential and commercial developments and will guide the location of existing and planned essential services in flood affected areas, as well as the town planning and development guidelines for these areas.

It is also recognised however that there are regional floodplain implications that need to be considered by State Government and Local Government collectively, such as roads and transport, regional planning (including future development aspirations), natural resource management, and emergency planning.

It is anticipated the bulk of the Floodplain Development and Risk Management Investigation work would be completed by the relevant Local Governments (utilising a common agreed approach).

There may be strategic options generated in this investigation that will be specific to Floodplain management and which can feed ultimately into the broader study considerations. Inputs for the Floodplain Development and Risk Management investigations will also be generated from the Flood Management and Control Investigation and formulated to provide an indication as to how an option may impact on existing and future development.

Collectively however, the working group which will include the local authorities as well as State Government representatives such as DERM, Department of Local Government & Planning, Department of Transport & Main Roads, Queensland Reconstruction Authority, Emergency Management Queensland, can also consider broader regional issues and agree regional responses and standards.

Options Identification

- Assist in the development of the long list of options.
- Assist in the qualitative assessment of the long list of options, relative to floodplain risk management. It is not envisaged that this would involve detailed modelling work, but instead would align with a risk management approach (i.e. a performance based or qualitative assessment of the potential of an option to reduce the frequency of flooding and/or associated consequences to the community).

Options Analysis

- Derive an approximate relationship between flood damages and peak flows at Port Office based on the 2006 Brisbane Valley Flood Damages Assessment by combining the three LGA's (Brisbane, Ipswich and Somerset Regional) and increasing costs due to CPI and population increases. This relationship between flood damages and peak flows can then be used for preliminary estimates of the benefits of options. This preliminary flood damages model would need to include estimates of intangible and indirect flood damages (which were not included in the 2006 flood damages assessment).
- Using the results of the hydrological and hydrodynamic modelling as inputs, determine flood extents for the various scenarios and options being considered. WaterRide software (or equivalent) would be utilised to develop the flood extents based on ALS data and the MIKE-11 flood model outputs.
- Develop flood stage-damage curves for the Brisbane, Ipswich and Somerset Regional Council areas, building upon previous study work and augmenting with residential and commercial/industry damages data to derive stage-damage curves (the extent of this approach to be agreed, developing a full data set versus selective sampling).
- Derive floor levels of buildings within the potentially flooded areas of Brisbane, Ipswich and Somerset Regional Council areas. The derivation of these floor levels could be based on the previous 2006 work and extended to include recently constructed buildings (2006 to 2011). Alternatively, a more extensive process could be used to derive estimated building heights (based on Google Street View) above ground levels (based on ALS data) to derive building levels, or alternatively through physical survey. This process would also include assessment of commercial areas for commercial damages estimates.
- Develop a flood damages model of the Brisbane, Ipswich and Somerset Regional Council areas using the three above listed elements. This model would be able to assess options based on the agreed hydrodynamic flood model outputs as a primary input. In this way, this flood damages model would be an improvement upon the preliminary flood damages model (see first dot point above) as it would reflect changes in flows and flood extents not just measured at the Port Office. The damages model would also include estimates of intangible and indirect flood damages (which were not included in the 2006 flood damages assessment), which may include detailed economic/social studies.
- Quantify the flood hazard and risks (downstream) for full range of flood events (specifically existing development, future development and residual risk elements). This is to include assessment of impacts of the short list of options on floodplain risk (for full range of flood events), including:
 - Impacts to loss of life risk (changes to flood hazard)
 - Impacts to houses and multi-residential dwellings

- Impacts to commercial and industrial premises
- Impacts to access / evacuation routes
- Impacts to land use planning and development control
- Impacts to sand and gravel extractions
- Impacts to river traffic (e.g. disruption to City Cat services)
- Impacts to other services (eg water and wastewater, electricity)
- The assessments to be based on results of flood modelling and integrated with the economics assessment.

Outputs/Deliverables

- Contribution to option development, characterisation and assessment around floodplain risk management options.
- Flood damage curves for direct and indirect project impacts.
- Analysis of options, as basis for comparison, including identification and quantification of flood hazards/risks.
- Technical packages aligning with key deliverables.
- Draft and final technical reports.

Project Management and Interfaces

- Prepare a monthly project management report, in a format to be provided by the Project Management Team.
- Attend the Technical Working Group meetings.
- There is an expectation that regular interaction will occur with the organisations delivering the other two technical studies (Flood Control/Management Options study and Water Supply Security assessment), the economics assessment and the Technical Planning Groups, Independent Review Panel and Steering Committee members, as required.

Water Supply Security Assessment

Overview

The Water Supply Security Investigation would review the impacts of options upon the water supply security for the SEQ region, including upon existing capital works programs, operating costs and short-term risks to supply.

Some of the options under consideration will include how the dams' Full Supply Levels are set and managed now and into the future.

There may be significant water supply security risks involved in temporarily or permanently lowering the Full Supply Levels of the dams. Scenario analysis contained in the South East Queensland Water Strategy indicates there is the potential for climate change to negatively impact the region's water supply in the near future. Impacts from climate change may lead to additional water supply infrastructure being required to service communities from 2017, with construction needing to commence by 2014. Reducing the Full Supply Level of the dams may have the potential to bring this timetable forward even further.

Any option to be nominated to the State for consideration would require a full assessment of any associated impacts on urban water supply security in South East Queensland. To provide a comprehensive investigation, it is anticipated the Technical Working Group would consider:

- The implications for the Water Resource (Moreton) Plan 2007 and the Moreton Resource Operations Plan.
- The implications for the SEQ Regional Water Supply Strategy and associated Water Security Program.
- The implications in relations to increased operating costs and operational supply risks
- Integration of the considerations with those of the Flood Management and Control Investigation discussed in Section 3.2 of this Report.
- Integration of the considerations with those of the Floodplain Development and Risk Management Investigation discussed in Section 3.2 of this Report.
- Consultation with and advice from the BoM and the Office of Climate Change on long-term weather patterns and forecasts.

Options Identification

- Assist in the development of the long list of options.
- Assist in the qualitative assessment of the long list of options, relative to water supply security. It is not envisaged that this would involve detailed modelling work, but instead would align with a risk management approach (i.e. a performance based or qualitative assessment of the potential of an option to either reduce or increase water supply security risk).

Options Analysis

- Assess impacts of options that alter characteristics of reservoirs (such as a change to full supply level) on storage performance/reliability. This is to be assessed using IQQM model and will feed back to the hydrologic modelling.
- Assess impacts of options on the long term Level of Service (LOS) Yield, to be assessed using Regional Water Balance (Wathnet) model and therefore corresponding impacts on timeframes for regionally significant infrastructure augmentation.
- Assess impacts of options on the long term system yield, to assess the frequency of reaching various levels in storages over the long term (and triggering restrictions, introduction of PRW or triggering construction of drought response infrastructure).
- Assess impacts of options on the ability to meet the short-term System Operation Plan (SOP) risk criteria and associated probabilities of reaching specific storage volumes. This is to include assessment for impact upon short to medium term operating costs, associated with the likelihood of triggering full desalination (60%) and indirect potable reuse (40%). This is likely to also include use of the WASPP water balance model.
- Undertake sensitivity analyses (or include as a prime option) to consider possible alternatives of amending the LOS, achieving further demand management or utilising existing infrastructure differently.

Outputs/Deliverables

- Contribution to option development, characterisation and assessment, around impacts of options upon water supply security.
- Timing implications for future system capacity upgrades for each short-listed option.
- System operational impacts, including on recurrent costs.
- Sensitivity analyses
- Technical packages aligning with key deliverables.
- Draft and final technical reports.

Project Management and Interfaces

- Prepare a monthly project management report, in a format to be provided by the Project Management Team.
- Attend the Technical Working Group meetings.
- There is an expectation that regular interaction will occur with the organisations delivering the other two technical studies (Flood Control/Management Options study and Floodplain Risk Management assessment), the economics assessment and the Technical Working Groups, Independent Review Panel and Steering Committee members, as required.

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Economics Assessment

Inputs to Economic Modelling

- Costing of options (structural, operational, land use planning and control, policy). Prepare cost estimates for options where estimates are not available (capital and recurrent), for example, for the flood control/management structural options.
- Flood stage-damages curves for Brisbane, Ipswich and Somerset, based on enhancement of previous study work and then a January 2011 damages assessment.
- Assessment of impacts to water security, including acceleration of existing investment program, and operational impacts.
- Assessment of social, indirect financial and environmental impacts for each short-listed option. It is envisaged that the source data for this activity will be a mixture of various existing published information (relatively high level in nature in some parts), potentially coupled with both desktop and detailed economic, social or environmental studies as part of the scope herein.

Economic Analysis and Outputs

- Undertake integrated analysis of flood control/management, floodplain risk management and water supply security impacts associated with each option.
- Undertake incremental analysis of options in relation to the base case, business as usual option.
- Undertake financial modelling of options using a life-cycle cash flow analysis with consideration of capital and recurrent costs
- Undertake economic modelling of options using a Cost Benefit Analysis (CBA) approach that incorporates:
 - Life-cycle cash flows
 - Assessment of economic, social and environmental impacts drawing upon inputs from technical studies
 - Sensitivity analysis on key assumptions
 - Monte Carlo Analysis to define confidence limits around various input (including a risk-cost approach to cost estimates)
- Undertake optimisation of portfolio of options using a least cost approach.

Outputs/Deliverables

- Net Present Value (individual financial, environmental and social components can be shown as direct/indirect costs) and Benefit Cost Ratio for the various options.
- Draft and final economic assessment reports.

Project Management and Interfaces

There is an expectation that regular interaction will occur with the organisations delivering the three technical studies (Flood Control/Management Options study, Floodplain Risk Management assessment and Water Supply Security assessment) and the Technical Working Groups, Independent Review Panel and Steering Committee members, as required.

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Communications and Engagement

Community engagement is critical to the success of the Optimisation Study. Community engagement provides access to a broad range of information that can support the decision-making process that may otherwise not be readily available. It also helps the impacted community understand the issues behind the decision-making process and related constraints or opportunities. The views of the community are considered to be critical in ensuring the selected dam management options are those that will best support the future development and prosperity of South East Queensland communities.

Through the course of the Study, it is expected community engagement processes will be managed by the relevant City and Regional Councils, supported by the State. Local Governments are best placed to engage with their own communities through existing engagement mechanisms including established relationships with the community and relevant community organisations.

The widely accepted practice of community engagement involves informing, consulting and active participation within the community.

Informing

It is important the community understands how the Study will aim to balance the current and future needs of the community with existing dam operating procedures and management practices. It is also important the Community understands how they will be able to provide input into the Study. Communicating the results of the Study back to the public will also help the community understand how the dams are to be operated in the future and why the selected dam management options were chosen.

Consulting

Community consultation involves obtaining feedback from the community about dam management options and identifying issues of concern to the community that must be considered as part of the Study. The considerable experience held by Councils in this area, together with their existing consultation networks, will be the key to the success of this component.

Active participation

Active participation involves working directly with community representatives to ensure community wants and needs are consistently understood. Where beneficial to the community, it is expected specifically-identified community representatives participate through a Stakeholder Reference Group. For example, active participation from community groups such as the Mid Brisbane Irrigators Association would provide important input to the Study.



Scope Cross-Reference – WSDOS and QFCI Interim Report Recommendations

The following table provides a cross-referencing of the QFCI August 2011 report recommendations with the WSDOS scope, including identifying (where not in scope) where the recommendation could impact WSDOS or alternatively where WSDOS work may impact upon certain recommendations.

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Appendix B Risk Management Plan

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Wivenhoe Dam and Somerset Dam Optimisation Study

STUDY RISK AND OPPORTUNITY ASSESSMENT

- 27 September 2011
- Rev 1

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Wivenhoe Dam and Somerset Dam Optimisation Study

STUDY RISK AND OPPORTUNITY ASSESSMENT

- 27 September 2011
- Rev 1

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Abbreviations

AS/NZS	Australian Standard / New Zealand Standards
BCC	Brisbane City Council
BoM	Commonwealth Bureau of Meteorology
C	Consequence
DERM	Queensland Department of Environment and Resource Management
DLGP	Queensland Department of Local Government and Planning
HSEC	Health, Safety, Environment & Community
ICC	Ipswich City Council
L	Likelihood
LGAQ	Local Government Association of Queensland
NGO	Non-government organisation
PMP	Project Management Plan
QA / QC	Quality Assurance / Quality Control
QLD	Queensland
QWC	Queensland Water Commission
R	Risk
SKM	Sinclair Knight Merz
SRC	Somerset Regional Council
T&C	Terms and Conditions
ToR	Terms of Reference

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1. Risk Assessment

1.1. Background

At the Project Establishment Workshop for the Wivenhoe Dam and Somerset Dam Optimisation Study (WSDOS), the Steering Committee identified potential threats and opportunities which may influence the successful Project Management of the study. The outcome of the above process has been used to develop a risk register, outlining risk mitigation and opportunity realisation actions for the Study.

It is acknowledged that project management risks and opportunities related to the Study will change throughout the life of the Study. To address this, it is intended that this document remains a 'live' document and will be further reviewed and updated at intervals as defined in Sections 1.5 and 1.6 of this document. The risk assessment will also be updated accordingly where issues or opportunities are closed out, including through input from the various Technical Working Groups.

1.2. Purpose of the Risk and Opportunity Assessment

The risk and opportunity assessment will be used to:

- identify and assess foreseeable risks and opportunities to project timeframes, budget, quality or stakeholder interactions, and develop effective mitigation strategies that can be implemented by the WSDOS governance structure to manage these risks and opportunities; and
- provide confidence to the Steering Committee that project management risks and opportunities have been thoughtfully considered and addressed within the PM Plan.

1.3. Methodology – Analysis of Risks/Threats

Risk assessment and management is an iterative process consisting of a series of well-defined steps, taken in sequence, to provide insight into the risks relating to project management of the study.

Standards Australia has a 'Risk Assessment' standard (ISO31000) which provides a framework for establishing the context, identification, analysis, treatment and monitoring of risk. The standard is generic, as it recognises that the design of the risk assessment will need to account for the objectives of the analysis, the needs of an organisation and its products and services, and the process and practices used by the organisation.

ISO31000: 2009 describes a method for assessing risk by combining the consequence from a hazard occurring with the 'Likelihood' of the hazard and its impact, in terms of its effects on the environment. The flexibility provided for in the guideline and standard allows the basic concepts and principles of risk assessment to be developed to cater for the specific aspects of 'Consequence'

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and 'Likelihood' relevant to the issues being assessed (in this case, the risk of the WSDOS not being delivered).

1.3.1. Consequence

Consequence (C) describes the impacts using the descriptors in **Table 1-1**.

■ **Table 1-1 Consequence (C)**

Level	Descriptor	Description
1	Insignificant	<ul style="list-style-type: none"> ■ No additional costs to project manage study ■ No changes to scope ■ No delays to schedule
2	Minor	<ul style="list-style-type: none"> ■ Minor delays (ie. weeks) to schedule ■ Minor changes to scope ■ Variation costs to project management of less than \$10 000
3	Moderate	<ul style="list-style-type: none"> ■ Significant delays (ie. months) to schedule ■ Significant changes to study scope ■ Variation costs to project management of \$10 000 - \$100 000
4	Major	<ul style="list-style-type: none"> ■ Major delays (ie. 6 months) to Project finalisation ■ Requirement for major stakeholder negotiation and /or major revision of documentation post-release ■ Media or NGO condemnation, and potential class action, and making implementation of outcomes difficult. ■ Variation costs to project management of \$100 000 - \$1 000 000
5	Catastrophic	<ul style="list-style-type: none"> ■ Major delays (ie. years) to final outcome implementation ■ Study viewed as being irrelevant by decision makers ■ National and International attention, media and NGO condemnation, making implementation of outcomes extremely difficult. ■ Variation costs to project management of \$1 000 000

1.3.2. Likelihood

Likelihood (L) is a qualitative estimate of the frequency at which the 'issue' or 'hazard' may occur. Likelihood (L) is described in **Table 1-2**

■ **Table 1-2 Likelihood (L)**

Level	Descriptor	Description
1	Almost Certain	Is expected to occur in most circumstances
2	Likely	Will probably occur in most circumstances
3	Possible	Might occur at some time
4	Unlikely	Unlikely to occur at any time
5	Rare	May only occur in exceptional circumstances

1.3.3. Risk Assessment

The combination of likelihood and consequence provides the qualitative measure of risk as shown in Table 1-3, the Risk Matrix.

■ **Table 1-3 Risk Matrix**

Likelihood	Consequences				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
E (almost certain)	Moderate	Significant	High	High	High
D (likely)	Moderate	Moderate	Significant	High	High
C (possible)	Low	Moderate	Moderate	Significant	High
B (unlikely)	Low	Low	Moderate	Moderate	Significant
A (rare)	Low	Low	Low	Moderate	Moderate

The risk and opportunity assessment table in Section 1.5 includes the:

- issue (or hazard) that may impact on the Study outcomes;
- cause of the issue and the potential impact of the issue (if no controls adopted);
- Consequence (C), Likelihood (L) and Risk (R, initially without controls in place);
- primary control strategy;
- Consequence (C), Likelihood (L) and Risk (R, with the primary controls in place); and possible further actions, should they be required to control the impacts to acceptable levels

1.4. Methodology – Analysis of Opportunities

The goal in identifying opportunities is to provide a basis for progressively seeking to leverage or realise these opportunities. As this is the converse of the goal for risk identification, the risk management methodology above has not been fully utilised. It is possible to identify the context of the opportunity, potential management measures to leverage or realise the opportunities and associated benefits. In terms of the qualitative assessment, a simpler approach has been adopted.

■ **Table 1-4 Potential Opportunity Benefits**

Opportunity	Potential Benefits		
	Current Status or Business-as-Usual (BAU) 1	Meaningful Improvement to BAU 2	Major or significant improvement to BAU 3

1.5. WSDOS Project Management: Risk Assessment

Date of Last Change:	8:39 AM	26 September 2011
C = Consequence (of impact occurring) L = Likelihood (of issue arising) R = Risk (initially without controls; then with Controls in place)		

Identification			Control Strategy				Assessment and Review					
#	Issue	Cause(s)	Potential Impact(s)	C	L	R	Primary Controls	C	L	R	Date for SC Review	Champion
1.	Timeframe - outcomes											Steering Committee (BN/SD)
2.	Scope creep			3	D	Significant	1. Agree to the detailed scope for the project up front and sign off on this in the PMP 2. Maintain a focus and ongoing commitment to managing the project to the agreed scope 3. Establish scope change management processes within the PMP to ensure that any scope changes are endorsed and not a result of creep	2	B	Low	Nov 2011 initial review Then 3 monthly	Steering Committee (AF)

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Identification				Control Strategy				Assessment and Review				
#	Issue	Cause(s)	Potential Impact(s)	C	L	R	Primary Controls	C	L	R	Date for SC Review	Champion
3.	Other related but separate projects	There are numerous separate studies that can impact the management and outcomes of this WSDOS.	Some will complement – but others may have the potential to establish Government directions that will directly impact the work within and outcomes of WSDOS.	4	E	High	<p>1. Continually scan the broader environment to maintain an ongoing awareness of separate but related projects. For identified projects – maintain awareness of and review the objectives, plans and status of those projects in order to: align WSDOS and other project outcomes where necessary; leverage the work and investment in related projects to maximise the effectiveness and outcomes from WSDOS; influence the manner in which other projects are being undertaken to ensure alignment</p> <p>2. Steering Committee to invite Project representatives from separate projects to present to SC or into the WSDOS governance structure, where appropriate</p> <p>3. Ensure cross representation on separate project governance to maintain ongoing alignment of project outcomes where appropriate, and to effectively manage impacts on WSDOS.</p>	2	E	Significant	Oct 2011 initial review Then 2 monthly until agree risk has reduced	Steering Committee (AF)
4.	Ongoing QFCI Process											Steering Committee (CW)



Identification			Control Strategy				Assessment and Review					
#	Issue	Cause(s)	Potential Impact(s)	C	L	R	Primary Controls	C	L	R	Date for SC Review	Champion
5.	Management of external stakeholders											Steering Committee (BN/SD)
6.	Impact of Elections											Steering Committee (MP)
7.	Climate and upcoming wet season	No peer-reviewed scientific assessment denies climate change. Global temperature rise is now accepted by the scientific community as inevitable.	Although there is uncertainty, bulk of scientific opinion is that annual rainfall in SEQ is likely to decline, but extreme event rainfall is likely to increase. Need to weigh impact of reduced annual rainfall on water supply security against increased risk of flooding due to short-notice water releases to protect dam integrity as a result of increased extreme event rainfall.	3	D	Significant	1. TWG/Is to include climate change considerations in detailed scopels. Studies to investigate the combined impacts/risks of reduced annual rainfall and increased extreme event rainfall. (The studies should deliver a better understanding of the consequences of climate change so that policy settings can be appropriately adjusted).	2	D	Moderate	Dec 2011 initial review Then 3 monthly	Steering Committee (GW)



Identification			Strategy to Leverage or Realise		Outcome		Assessment and Review	
#	Issue	Context of Opportunity	Current Status	Actions	Potential Benefits	Target Status	Date for SC Review	Champion
6.	Cost and benefit sharing, minimisation of damages	The extent to which the economic/financial/social benefits are shared by stakeholders (i.e. State, Local Government, businesses, individuals) will depend largely on the approach taken to identifying/assessing options		<ol style="list-style-type: none"> 1. Ensure effective engagement of all participating organisations and stakeholders in the optimisation study. 2. Ensure, as far as possible, all key participants have 'ownership' of study's deliberations and outcomes. 3. Scoping of any economic cost-benefit assessment needs to be comprehensive, i.e. not limited to or focused on particular stakeholders. 4. Effective communication to participating organisations and stakeholders of the rationale (i.e. shared costs/benefits) of any preferred/recommended options. 	An effective assessment of options, while identifying the overall net cost/benefit, will need to also address the relative costs/benefits for various stakeholders to reduce likelihood of 'perverse' outcomes for certain stakeholders and/or demand/requirement for significant subsidisation of negatively affected stakeholders.		Dec 2011 initial review Then 3 monthly	Steering Committee (KS/PW)
7.	Input to statutory planning (ie revision of SEQ Regional Plan)							Steering Committee (MP)



Identification			Strategy to Leverage or Realise		Outcome		Assessment and Review	
#	Issue	Context of Opportunity	Current Status	Actions	Potential Benefits	Target Status	Date for SC Review	Champion
8.	Currently have security of water supply in system (allows time to consider)	In summary current modelling indicates that the short term (five year) Risk Criteria of the SEQ System Operating Plan would be met (based on current demands and assuming all other storages are full) even under certain scenarios of reducing the Wivenhoe Dam full supply level.		Provide community awareness of the study and that adequate water supplies are available, including the promotion of public confidence in the SEQ water entities ability to manage water supply and flood management issues in the region, considering a triple bottom line approach. A number of options can be considered in detail given the current levels of water security.	The major benefit is that there is a security of water supply which allows a thorough assessment of the optimisation of the water supply and flood mitigation function of Wivenhoe Dam Promotes the benefits of the SEQ Water Grid allowing for the flexibility in operation.		Dec 2011 initial review Then 3 monthly	Steering Committee (KW)

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Job Safety Environmental Analysis



Job Safety Environmental Analysis (JSEA) Part (B)

Project Name:
PM Wivenhoe & Somerset Dam Optimisation Study (WSOS)

Project Number:
QE09934

JSEA No:
 QE09934-JSEA-v1

Stage 1	Break the activity into steps. Each of the stage should be logical and describe the step in simple terms.
Stage 2	Identify the hazards associated with each step. Consider uncontrolled sources such as Gravity, Electrical, Mechanical, Manual Handling, Pressure, etc.
Stage 3	Using the risk ranking as defined in Part A. Rank the Consequence and Likelihood of the hazard becoming actual. C =Consequence: L =Likelihood: R = Risk.
Stage 4	Develop controls necessary to manage the hazards. Consider the Hierarchy of Controls starting at Elimination to Personnel Protective Equipment.
Stage 5	Using the risk ranking as defined in Part A Re-rank the Consequence and Likelihood to determine if the controls have reduced the risk to an acceptable level.
Stage 6	Nominate the person responsible for managing / working to the controls as nominated

BEFORE PROCEEDING TO SITE CONTACT YOUR REGIONAL HSEC MANAGER/COORDINATOR OR ADVISOR TO ARRANGE A SITE AUDIT

	SS: RISK RATING	SS: RISK RATING			SS: RISK RATING	Stage 6 Res: person
		C	L	R		
Stage 1 Job Step		C	L	R	C	Stage 6 Res: person
Plan for trip	n/a					All Persons Visiting Site
						All Persons Visiting Site
						All Persons Visiting Site
Travel to/from site	Injury from vehicle accident	1	D	H		All Persons Visiting Site
					2	All Persons Visiting Site
	Driver fatigue	2	C	H		All Persons Visiting Site
						All Persons Visiting Site
					3	All Persons Visiting Site

Stage 1 Job Step	Stage 2 EHS Hazards	S3: RISK RATING			Stage 4 Solution / Control Measures	S5: RISK RATING		
		C	L	R		C	L	R
Travel to/from site (continued)	Hitting Wildlife	4	E	L	Drive to conditions			All Persons Visiting Site
					Avoid driving at dawn and dusk			All Persons Visiting Site
					Remain alert at all times			All Persons Visiting Site
					Use a 4WD (SKM or hire from rental company) if driving on unsealed roads	4	E	L
Accessing Private Property	Hostile residents	4	E	L	Obtain permission before entering private property. Staff to always travel in pairs. Be respectful and polite when accessing property			All Persons Visiting Site
					Maintain professional manner at all times by: - Wearing SKM clothing - Carry business cards	5	E	L
Working outdoors	UV exposure/dehydration	5	C	L	Wear broad brimmed hats. Long sleeved shirts and long trousers			All Persons Visiting Site
					Use high SPF sunscreen and apply every 4 hours			All Persons Visiting Site
					Carry adequate water. At least 3-4L per person per day.			All Persons Visiting Site
					Undertake work in shade, wherever possible	5	E	L
	Hunger	5	C	H	Take enough food to last the time in the field, including food with high sugar content in case of low blood sugar levels.	5	E	L
	Slips trips falls	3	C	M	Staff to wear safety footwear – boots with non-slip soles			All Persons Visiting Site
					Avoid areas with steep terrain/loose surfaces			All Persons Visiting Site
					Avoid carrying heavy loads in areas with steep terrain/loose surfaces			All Persons Visiting Site
					Watch where you walk and don't write while walking.			All Persons Visiting Site
					Carry first aid kit. At least 1 member of field team to have a current Applied First Aid certificate.	5	C	L
	Bad weather/Natural hazards	2	D	M	Check BoM website and recent news reports before commencing fieldwork			All Persons Visiting Site
					If threatening low-pressure system or storm activity is present, delay fieldwork until threat is abated			All Persons Visiting Site
					Carry wet weather gear (raincoat) in case of rain.			All Persons Visiting Site
					If threatening weather, bushfires or other natural hazards are present within close proximity to or at the time of field work, delay fieldwork until threat is abated	2	E	M

Stage 1 Job Step	Stage 2 EHS Hazards	S3: RISK RATING			Stage 4 Solution / Control Measures	S5: RISK RATING					
		C	L	R		C	L	R			
Working outdoors (continued)	Attack from domestic or farm animals	3	C	M	Obtain permission before entering private property. Where possible, telephone land owner prior to visit to ensure animals are locked up. Leave gates as you found them.				All Persons Visiting Site		
					Remain alert at all times				All Persons Visiting Site		
					Keep first aid kit in vehicle. At least 1 member of field team to have a current Applied First Aid certificate.	3	E	L	All Persons Visiting Site		
			Snakes and other wildlife	3	D	M	Wear safety boots and long trousers			All Persons Visiting Site	
						Wear insect repellent.				All Persons Visiting Site	
						Avoid walking through long grass or scrub				All Persons Visiting Site	
						Remain alert at all times				All Persons Visiting Site	
						Keep first aid kit in vehicle. At least 1 member of field team to have a current Applied First Aid certificate.				All Persons Visiting Site	
			Getting lost				Staff to carry mobile phone at all times	4	E	L	All Persons Visiting Site
				3	C	M	Always carry mobile phone and map				All Persons Visiting Site
Community consultation	Working near water				Notify Office Contact of monitoring plan (including location and likely finishing time) and send SMS to notify when site visit started and complete and if there is a change in plans.	4	D	L	All Persons Visiting Site		
			1	E	M	Stay at least 2m from unprotected edge where water is >1m deep and slope is >1V:2H	3	E	L	All Persons Visiting Site	
			3	D	H	Park car well off road or on side road. Where possible park car on same side of road as inspection (if busy road). Wear hi-vis vest.	3	E	L	All Persons Visiting Site	
			2	D	M	Avoid entering areas of sensitive vegetation/habitat. Trained personnel to undertake tasks such as fauna surveys, etc. Aim to leave site as you found it.	5	E	L	All Persons Visiting Site	
			5	E	L	Staff to avoid conflict situations with community member. Staff to always travel in pairs. Staff to treat community members politely and with respect	5	E	L	All Persons Visiting Site	
			5	E	L	Staff to familiarise themselves with emergency evacuation procedures for consultation venue (where appropriate).	5	E	L	All Persons Visiting Site	
			5	E	L	Staff to familiarise themselves with emergency evacuation procedures for consultation venue (where appropriate).	5	E	L	All Persons Visiting Site	
			5	E	L	Staff to familiarise themselves with emergency evacuation procedures for consultation venue (where appropriate).	5	E	L	All Persons Visiting Site	
			5	E	L	Staff to familiarise themselves with emergency evacuation procedures for consultation venue (where appropriate).	5	E	L	All Persons Visiting Site	
			5	E	L	Staff to familiarise themselves with emergency evacuation procedures for consultation venue (where appropriate).	5	E	L	All Persons Visiting Site	

Stage 1 Job Step	Stage 2 EHS Hazards	S3: RISK RATING			Stage 4 Solution / Control Measures	S5: RISK RATING			
		C	L	R		C	L	R	
Driving off road	Unsealed, gravel roads – risk of accidents and getting bogged	4	C	M	<p>Always have 4wd engaged when off bitumen. Ensure driver is experienced in driving off-road. Check creek crossings / boggy areas before crossing. Carry spare tyre and change equipment. Vehicles to carry fire extinguishers. Ensure vehicle is fundamentally stable when in park. Don't park in long grass with the vehicles running. Don't drive through long grass, unless necessary. Check vehicles upon leaving site for grass captured under vehicle. Do not drive over swollen watercourses or where visibility is not good. Appropriate communication equipment and first aid kits in vehicle.</p>	5	E	L	<p>All Persons Visiting Site</p>
	Spread of weeds	4	C	M	<p>Weed Management Strategy to be developed prior to departure if likely to be travelling in area with declared weeds.</p>	5	E	L	<p>All Persons Visiting Site</p>
	Damage to existing environment	2	D	M	<p>Follow established roads / tracks. Avoid areas of sensitive vegetation / habitat. Aim to leave site as you found it.</p>	5	E	L	<p>All Persons Visiting Site</p>

JSEA Proforma & Sign off Sheet

JOB SAFETY ENVIRONMENTAL ANALYSIS - SIGN OFF SHEET	Project Name: PM Wivenhoe & Somerset Dam Optimisation Study (WSDOS)	Project Number: QE09934	JSEA No: QE09934-JSEA-v1
ALL PERSONNEL UNDERTAKING THE WORK TASK MUST SIGN BELOW			
<p>I fully understand the requirements of this JSEA. Title of JSEA: PM Wivenhoe & Somerset Dam Optimisation Study (WSDOS) – Standard JSEA Person conducting the JSEA Training: Samantha Watt</p>			
Name: (print)	[Redacted]	Signature:	/ /
Name: (print)	[Redacted]	Signature:	/ /
Name: (print)	Scott Abbey	Signature:	/ /
Name: (print)	[Redacted]	Signature:	/ /
CONTACT PROCEDURES			
Daily	Field Team to contact Pat Nixon (via phone / text) at the beginning and conclusion of fieldwork each day. Failure to do so will trigger Pat Nixon to attempt contact by mobile phone to team in listed order. Inability to contact team will trigger Pat Nixon to contact scheduled accommodation service. Failure to contact via accommodation within 2hrs will trigger emergency response with local police station initially.		
Emergency	Contact Emergency Services for help, notify Pat Nixon.		
CONTACT NUMBERS			
SKM Office Contact	[Redacted]		
SKM Field Team	Name	Mobile	Next of Kin
	[Redacted]	[Redacted]	[Redacted]
	Scott Abbey		

JOURNEY PLAN

Date	6/09/2011		
Travel Details	Origin: SKM Office Start Time: ~7:30am	Destination: SKM Office Finish Time: 01:00pm	
Work Details	Start Time: 09:00am	Finish Time: 12:00pm	
Work Location	Meeting at Somerset Regional Council Office, Esk Various Brisbane River and tributaries floodplains and road crossing between Esk and Brisbane		
Expected Activities	Meet with Bob Bain, CEO, SRC Inspect floodplain and crossings		
Detail period and likelihood of mobile service availability	Likely 100% mobile coverage		
Accommodation	N/A – travel < 1day		



Appendix D Communications Plan

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SKM

Appendix E Confidentiality Agreement

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Appendix F Monthly Reporting Template

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Wivenhoe Dam and Somerset Dam Optimisation Study

Monthly Report No 1 – August 2011

EXECUTIVE SUMMARY

Study Progress Summary

Study Component	Costs	Schedule	Scope & Quality	Communications & Engagement	Risk	Comment/s including current and emerging issues
Overall Study						Important period for establishment of groups and progressing towards effective operation. Mobilisation of TWG's now a priority. Is a level of agreement around high level scope, but now need to resolve detailed scope and corresponding schedule. Interface with other external studies needs to be carefully managed.
Independent Review Panel						<i>Not yet formed. Potential panelists to be reviewed by Steering Committee on 15 Sept 2011.</i>
Stakeholder Reference Group						<i>Not yet formed. Seeking nominations for members from Steering Committee. First meeting planned for late Sept or early Oct 2011.</i>
Integration Group						<i>Not yet formed. Planned to form in Sept 2011.</i>
TWG 1 - Water Supply Security						<i>Not yet formed. Planned to form in Sept 2011.</i>
TWG 2 - Flood Management & Control						<i>Not yet formed. Planned to form in Sept 2011.</i>
TWG 3 - Floodplain Risk Management						<i>Not yet formed. Planned to form in Sept 2011.</i>
WG - Communications & Engagement						<i>Not yet formed. Planned to form in Sept 2011.</i>
Project Management Team						Resolution of scope of (and schedule for) project management team services relies upon resolving detailed scope of project.

Achievements – July/August 2011

- Project Establishment Workshop held (updated Study proposal document issued to stakeholders prior)
- Steering Committee established and first meeting held. Agreed objectives, components of higher level scope and governance structure and membership.
- Draft Project Management Plan issued to stakeholders (Rev 2), including review of scope against QFCI recommendations
- A number of Independent Review Panellists have been identified

Planned Activities – September 2011

- Hold initial meetings of all Working Groups
- Steering Committee Meeting No 2 planned for 15 Sept 2011, will include Communications and Stakeholder Reference Group meeting planning, review of Independent Review Panel candidates and Options and Economic Analysis approach
- Continue to update Draft Project Management Plan









Financial

- Project Management Team cost \$136,888 (ex GST, to 14/08/11), engaged by Seqwater
- All other costs currently in-kind by participating organisations

Schedule – Key Milestones – Phases 1 and 2, Input to QFCI final report

Milestone Description	Target Completion Date	Actual Completion Date
Engage with organisations, Project Establishment Workshop and agree representation for Steering Committee	End July - Early August 2011	End July - Early August 2011
Steering Committee Meeting No 1	Mid August 2011	25 August 2011
Technical Working Groups first meetings	Late August 2011	
Develop initial Options Analysis Framework (including objectives and criteria setting, economic and financial analysis and risk management approach)	August – October 2011	Initial draft working paper presented to SC 25 Aug
Independent Review Panel Meeting No 1	End September 2011	
Develop Initial Long List of Options	September - October 2011	
Prepare detailed Scope of Work – Flood Management/Control Options Study, Water Supply Security Options Study, Floodplain Management Assessment, Economics/Financial Assessment	September – November 2011	
Develop approach to Community engagement	October – November 2011	
Develop approach to management of residual risks (and potential scope of associated planning activities by others)	October – November 2011	
Progress Report No 1	December 2011	

Study Risk Profile (Top 4 Risks & Opportunities)

#	Risk	Status	Comment	Strategy to manage
1	External factors – eg other related but separate projects, QFCI process continues, State/Local government elections		Other studies and external influences can impact the management and desired outcomes of WSDOS. Conversely, some may compliment (an opportunity).	Continually scan broader environment to maintain an ongoing awareness of external factors. Review objectives, plans and status of external projects to align WSDOS and pother project outcomes, leverage from work and influence where appropriate to achieve alignment
2	Scope agreement and scope creep management		While the SC has agreed scope at a higher level, more work required to define in detail.	Empower Technical Working Groups to develop detailed scope. Clearly enunciate scope in PMP and apply scope change management processes.
3	Communication - wider community, interest groups, media, loss of agenda		Important that consistent messaging from all participants in the WSDOS process occurs, including to support any broader messages around flood management and mitigation.	Be clear about key messages. Form Stakeholder Reference Group and Communications and Engagement Group in the short term and develop Communications Plan.
4	Cost impacts of options (note: cost sharing to achieve benefits represents a possible opportunity)		Ultimately government (State and Local) will decide upon any preferred options and associated costs.	Undertake robust economic and financial analysis in WSDOS, so that cost implications and benefits realised to all parties are well understood.
#	Opportunity	Status	Comment	Strategy to leverage
1	Sharing of and consistent approach to modelling and data capture (link also to communication)		Opportunity to investigate feasibility of developing a catchment scale hydrologic and hydraulic models, for different uses	If agreed by SC, establish a focused task to investigate this potential under WSDOS. Look also at opportunity to better coordinate data capture and use.
2	Inclusion of Climate Change considerations		Need to weigh reduced annual rainfall on water supply security against increased risk of flooding due to more extreme events.	Factor in analyses around climate change (eg as sensitivity analyses) in the WSDOS technical studies.
3	Currently have water supply security across SEQ		Risk Criteria of the SEQ Operating Plan for the next 5 years can be met, even if certain temporary wet season storage reductions are applied.	Opportunity to promote water supply security, SEQ Water Grid flexibility and triple-bottom line approach, when communicating around options.
4	Inform communication processes of SC stakeholders through data collection and analysis		Opportunity, through WSDOS, of continuing to improve communication (by State/Local governments) around flood risk, as improved data and information becomes available.	Undertake high quality data analysis to inform improved policy and infrastructure development, communications, promotion of products and services and capacity building and education.

Health, Safety, Environment & Community

- No matters or incidents to report this month

Formal Correspondence

IN

- Letter from Minister to Seqwater
- Letter from Queensland Floods Commission of Inquiry (QFCI) (18 July), regarding no objection to Study commencing
- Letters from Treasury (29 July), BCC (3 August), DERM (3 Aug), SEQ WGM (2 Aug) and DLGP (3 Aug) responding to Seqwater study introduction letter (27 July) and advising of Steering Committee representatives
- Letter from Somerset Regional Council (23 Aug) requesting inclusion of Mid Brisbane River Irrigators in the Study (in a Technical Working Group)

OUT

- Letter to QFCI, on behalf of Seqwater (11 July), seeking views on Study
- Seqwater Study introduction letter to QWC, DERM, SEQ WGM, DPC, Treasury, DCS, BCC, ICC, SRC, QRA, DLGP, BoM (27 July, 1 Aug), also requesting identification of Steering Committee members

Independent Review Panel Reviews

Document	Status	Comments
Nil at present		



Appendix G Quality Plan

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**Appendix H Stakeholder Reference Group –
Terms of Reference**

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