

QUEENSLAND FLOODS  
COMMISSION OF INQUIRY

**STATE OF QUEENSLAND SUBMISSIONS REGARDING FLOODS  
RELATED ISSUES WITH BRIDGES REFERRED TO IN DAMS MANUAL**

1. The State has received a letter from the Queensland Floods Commission of Inquiry dated 18 August 2011 in which departments were invited to make submissions about the following matters which may be the subject of comment in the Commission's final report:
  - (a) What are the flood-related issues associated with the bridges mentioned in the Manual?
  - (b) If there are any issues, how should they be investigated and/or resolved, and by which agency or agencies?
2. By letter dated 30 August 2011 the Commission clarified the information sought from the Department of Transport and Main Roads to be as follows (adopting the numbering used in the Commission's clarification letter):
  4. *Whether there are presently any plans to upgrade any of the bridges?*
  5. *Whether there are presently any plans to develop alternate routes to any of the bridges?*
  6. *Whether the State Government has been working with local council to develop plans to upgrade any of the bridges or develop alternate routes?*
  7. *Whether a cost benefit analysis or upgrading the bridges or developing alternate routes has been, or should be undertaken, and if so, by which agency?*
3. It is understood that the bridges to which reference is made in this invitation to be those listed in Appendix K of the manual of Operational procedures for Flood Mitigation at Wivenhoe Dam and Somerset dam, a copy of which is attached and marked **Attachment A**.

**Department of Transport and Main Roads (DTMR)**

**Questions 4 & 5 – plans to upgrade bridges and alternate routes**

The Operation of Wivenhoe Dam can affect the Brisbane River downstream of the dam.

Increasing water levels of the Brisbane River has particular impacts on known low points of the road network affecting both state and local government road departments.

Known low road points crossing the Brisbane River are:

- (a) Twin Bridges on Wivenhoe Pocket Road;
- (b) Savages Crossing on Banks Creek Road;
- (c) Mt Crosby Weir on Allawah Road and Stumers Road; and
- (d) Colleges Crossing on Mt Crosby Road.

Continuing growth within South East Queensland (SEQ) and in particular the Greater Brisbane Area presents ever increasing challenges for the road network. New and existing growth areas of Brisbane, Ipswich and Somerset regions are impacted by road closures at these low points.

The attached plan (**Attachment B**) displays the state and local network in the area surrounding Colleges Crossing.

### **Colleges Crossing on Mt Crosby Road**

During the closure of Colleges Crossing DTMR recommends travellers use detours via Mt Crosby Road, Warrego Highway and Ipswich Motorway.

DTMR provides permanent and temporary variable message signs on the Warrego Highway, Western Freeway, Mount Crosby Road and other activated and/or installed signs at appropriate locations. Other locations include (but not limited to):

- (a) Ipswich Motorway westbound, within proximity of the Progress Road On-Ramp
- (b) Ipswich Motorway westbound, within proximity of the Centenary Highway roundabout at Darra
- (c) Cunningham Highway northbound
- (d) Cunningham Highway eastbound
- (e) Brisbane Road eastbound
- (f) Logan Motorway westbound

The department also utilises barriers and Variable Message Signs to prevent motorists entering the flooded crossings on approach roads to Mt Crosby Road and Colleges Crossing. The department does not promote the Stumers Road, Allawah Road link as an alternative route because this is the responsibility of Ipswich City Council and Brisbane City Council who jointly manage this link.

DTMR requires advance notice of Seqwater of Wivenhoe Dam releases or adverse weather events that could impact on the closure of Colleges Crossing.

The Traffic Management Centres (TMCs) are a key interface for Seqwater to provide this advance notice. The TMCs provide 24 hour 7 day a week phone response via 13 19 40. This reduces reliance on individuals in the department who may be on leave or during after hours and may not respond to the received phone calls on emergency events.

DTMR is also investing in the improved signage to notify motorists. The attached plan shows the proposed upgrades to signage in and around this area (**Attachment C**).

## Planning Study

DTMR is undertaking a planning study to determine possible river crossing options over Brisbane River in the electorates of Ipswich West and Moggill to improve flood immunity and access for the local and regional community. It is expected this study will be completed by the end of February 2012.

This feasibility study covers the road network in the Brisbane suburbs of Karana Downs, Anstead, Moggill and Bellbowrie (the 'study area'). The project is based on the section of Mt Crosby Road from Moggill Road to Colleges Crossing as the state-controlled road. The study's objective is to identify various alternative sites for a new Brisbane River Crossing for general traffic between Brisbane and Ipswich and to improve flood immunity of roads thereby providing access to basic amenities in Brisbane and Ipswich during a future flood event.

The Minister for Main Roads announced this project on 15 February 2011. During the January flood, roads were closed by the floodwaters on Mt Crosby Road and surrounds at Pullen Pullen Creek, Kholo Creek, Moggill Ferry, Colleges Crossing and Mt Crosby Weir. Moggill Road was closed at several locations too, with locations at Grandview Road and Pullenvale Road being relevant to this study.

Five strategic options have been developed to provide flood immunity for this region with a base case for each. These strategic options form the basis of the selection process for the project going forward into the next phase of project development. The strategic options combine the 'location' options below.

The key to these Strategic Options is to upgrade Mt Crosby Road at Pullen Pullen Creek and Kholo Creek (the base case). Residents will then be able to travel north on Moggill Road to Kenmore during a flood event. With the addition of another river crossing at Moggill Ferry, Karalee, Mt Crosby or Colleges Crossing, residents will be able to travel south towards the Ipswich area.

Brisbane River Crossing options have been developed at the following locations:

- (a) Moggill Ferry
- (b) Karalee (Moggill Pocket Arterial Road)
- (c) Mt Crosby Weir
- (d) Colleges Crossing

Options for flood immunity improvement have been developed at the following locations:

- (a) Pullen Pullen Creek (Mt Crosby Road)
- (b) Kholo Creek (Mt Crosby Road)
- (c) Brookfield to Pullenvale permanent connection
- (d) Moggill Road near Pinjarra Road

Environment and cultural heritage aspects affecting this project have been reviewed by DTMR as a Concept Constraints Assessment.

A Comparative Cost Plan and a Strategic Costing have been developed for this planning study. The cost to provide a solution for the flood immunity of the study area is likely to range from \$134 to \$380 million, with the most likely cost between \$190 and \$288 million. It is not intended that this cost

be considered an estimate, as the level of detail adopted in the development of this 'estimate' is extremely low.

As such these numbers should be treated as an indicative order of magnitude only, to gain some understanding of the relative costs that could be expected when a more detailed planning and cost estimating exercise is undertaken in the next phase.

Areas identified for consideration on future studies are:

- (a) Selection of options and strategic options
- (b) Detailed flood study
- (c) Traffic modelling and analysis
- (d) Further engineering work
- (e) Consultation with stakeholders.

There are no current plans to upgrade any of the other named bridges or alternate routes.

#### **Question 6 – working with local councils re: bridges and alternate routes**

##### **Upgrades**

As is explained in the statement of Miles Vass, the road network in Queensland is defined into local roads (controlled by local councils) and state-controlled roads (controlled and managed by DTMR on behalf of the State). DTMR works with the relevant local councils when considering upgrades to bridges and/or river crossing particularly where there is a significant interaction at the site or proposed site, of local and state controlled roads.

##### **Operations**

In early 2003, an Alliance between the then Main Roads (MR), Queensland Transport (QT) and Brisbane City Council (BCC) agreed to develop a joint traffic and transport facility. In December 2006, the Brisbane Metropolitan Transport Management Centre (BMTMC) commenced operation, in a purpose built facility, of a real time transport operation centre. This facility has provided an excellent platform through which interagency incident management coordination is already being undertaken. DTMR, through the BMTMC works closely with many external agencies in providing coordinated real time incident management services to Brisbane's road network, the focus of which is to improve the City's road network safety and efficiency.

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A good working relationship exists between Seqwater, QPS, Councils and DTMR developed through a stakeholder interaction in dealing with road network activities across Brisbane, Ipswich and Somerset region's road network.

A draft MOU was prepared in March 2011 to formalise agreed arrangements for communication between Seqwater and DTMR relating to the river crossings on state-controlled roads. Advice from Seqwater is that rather than a stand alone communication protocol, the requirements would be incorporated into the overarching flood communication protocol document currently being finalised.

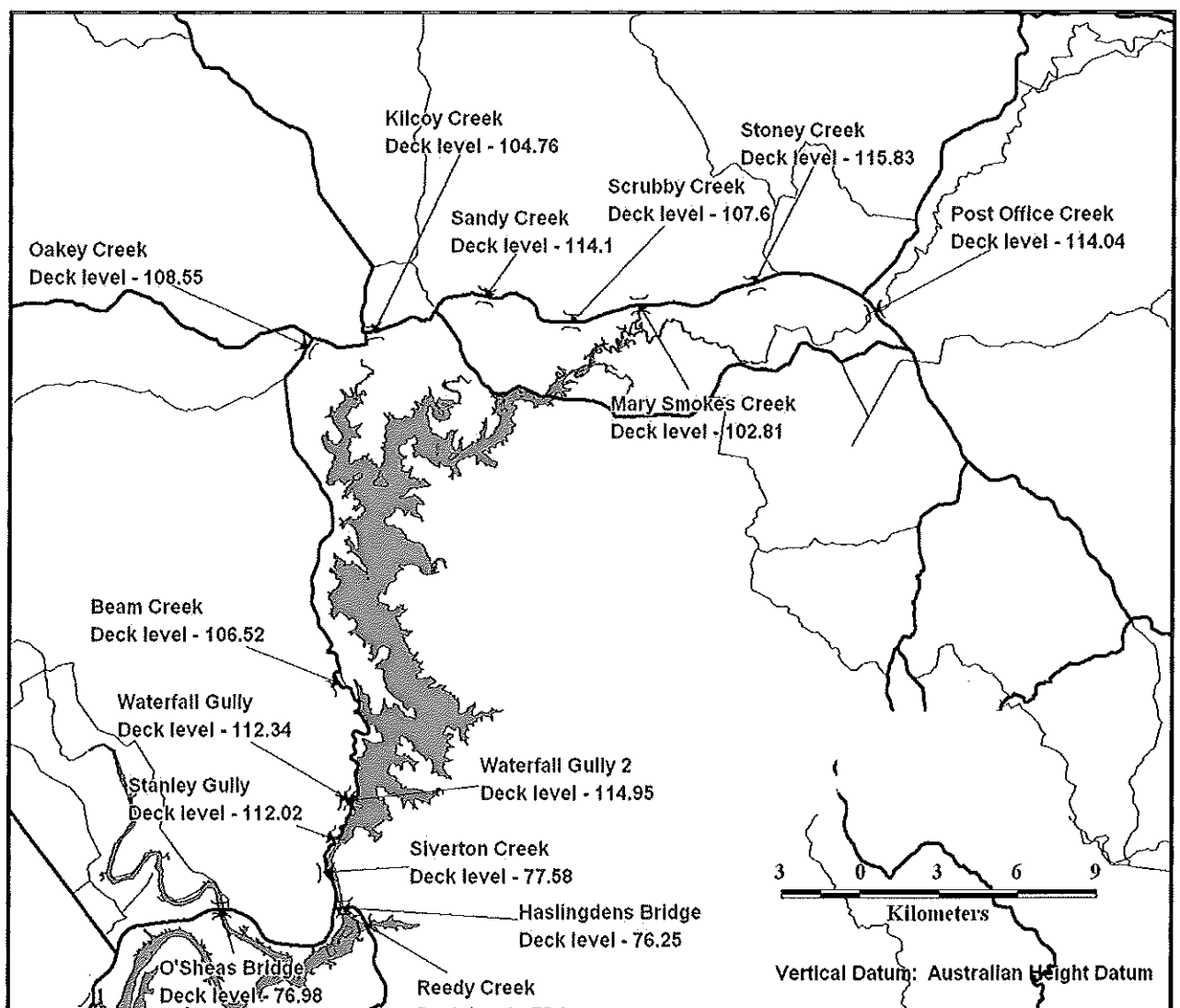
### Question 7 – cost benefit analysis

In the event any of the proposed upgrade projects are approved for delivery, the relevant agency, (for state-controlled roads for example, that would be DTMR) would be responsible for ensuring a costs benefit analysis was conducted as a component of the state Government's Project Assessment Framework (PAF). The PAF was the subject of extensive comment in the statement of Emma Thomas, then acting Director-General and Chief Operations Officer of DTMR.

## Department of Environment and Resource Management (DERM)

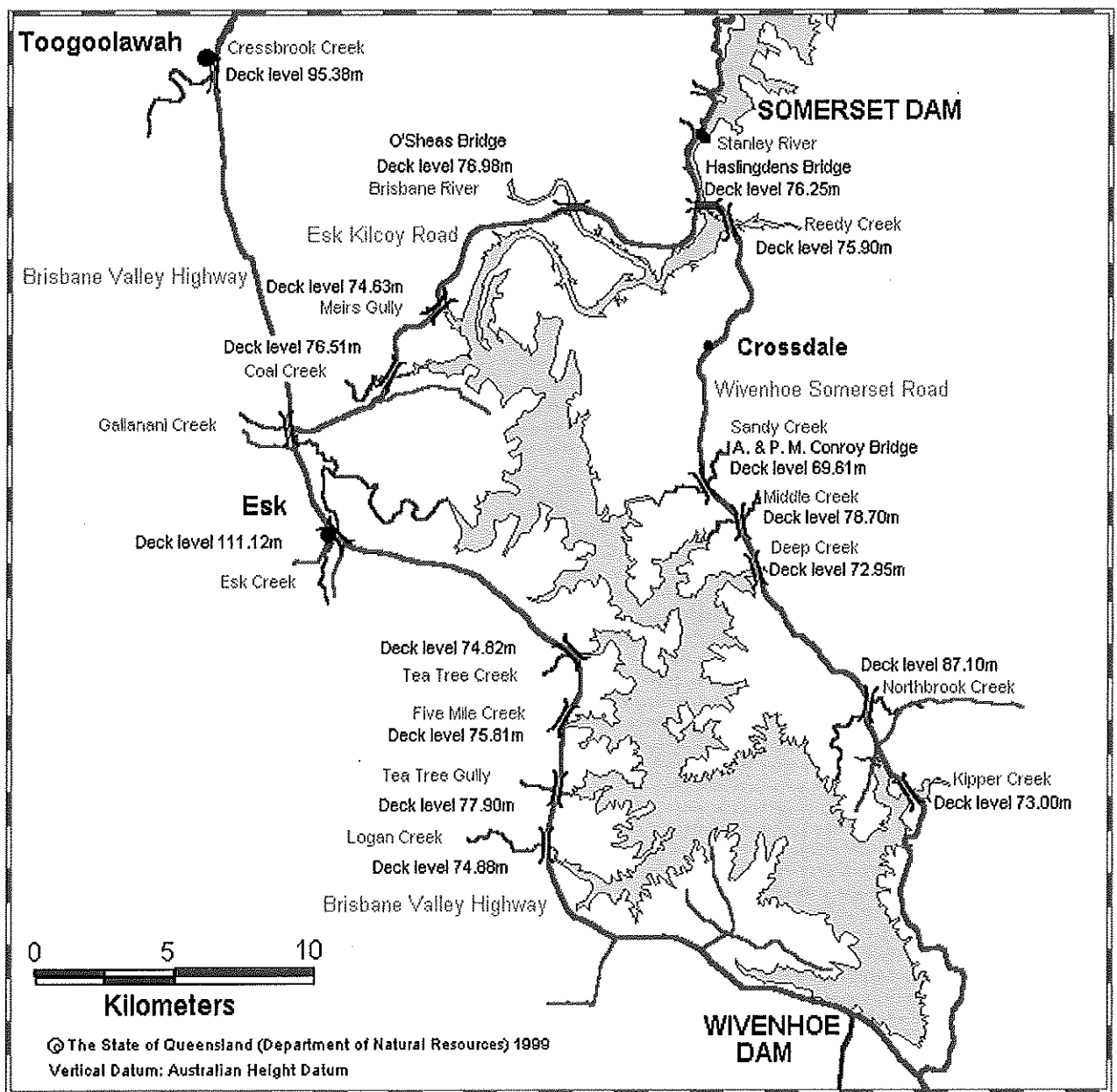
### Background - Names, Locations and Deck Levels of Bridges

Bridge Locations - Above SOMERSET DAM



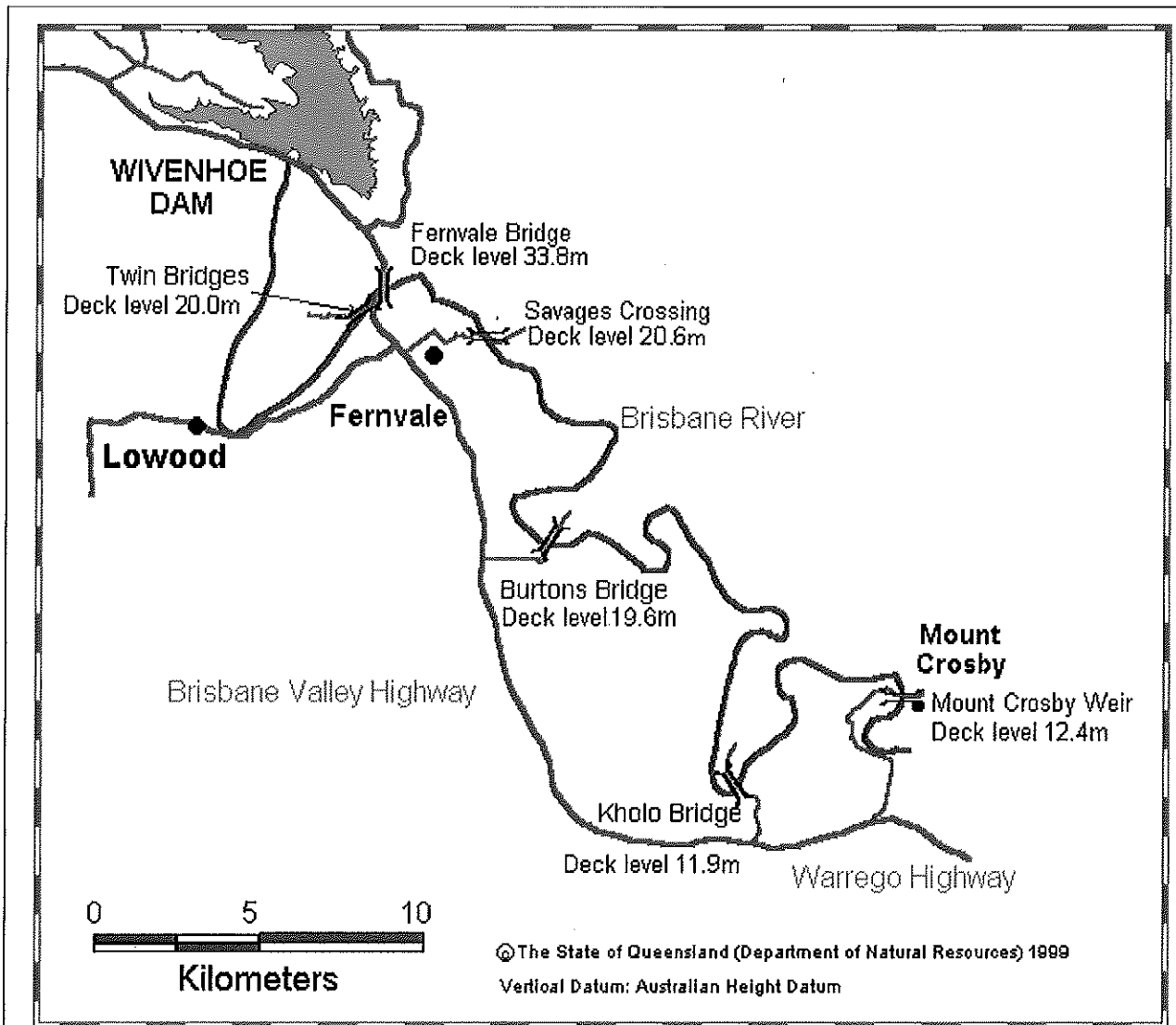
BRIDGE NAME	ROAD	DECK ELEVATION m AHD	LOCAL AUTHORITY
Mary Smokes Creek	D'Aguilar Highway	102.81	Somerset Regional Council
Kilcoy Creek	D'Aguilar Highway	104.76	Somerset Regional Council
Beam Creek	Esk Kilcoy Road	106.52	Somerset Regional Council
Scrubby Creek	D'Aguilar Highway	107.60	Somerset Regional Council
Oakey Creek	Esk Kilcoy Road	108.55	Somerset Regional Council

Bridge Locations – Below SOMERSET DAM and Above WIVENHOE DAM



<b>BRIDGE NAME</b>	<b>ROAD</b>	<b>DECK ELEVATION m AHD</b>	<b>LOCAL AUTHORITY</b>
A&PM Conroy Bridge at Sandy Creek	Wivenhoe Somerset Road	69.61	Somerset Regional Council
Deep Creek	Wivenhoe Somerset Road	72.95	Somerset Regional Council
Kipper Creek	Wivenhoe Somerset Road	73.00	Somerset Regional Council
Meirs Gully	Esk Kilcoy Road	74.63	Somerset Regional Council
Tea Tree Creek	Brisbane Valley Highway	74.82	Somerset Regional Council
Logan Creek	Brisbane Valley Highway	74.88	Somerset Regional Council
Five Mile Creek	Brisbane Valley Highway	75.81	Somerset Regional Council
Reedy Creek	Wivenhoe Somerset Road	75.90	Somerset Regional Council
Haslingdens Bridge at Stanley River	Esk Kilcoy Road	76.25	Somerset Regional Council
Coal Creek	Brisbane Valley Highway	76.51	Somerset Regional Council
O'Sheas Bridge at Brisbane River	Esk Kilcoy Road	76.98	Somerset Regional Council
Tea Tree Gully	Brisbane Valley Highway	77.90	Somerset Regional Council
Middle Creek	Wivenhoe Somerset Road	78.70	Somerset Regional Council

Bridge Locations – Below WIVENHOE DAM



BRIDGE NAME	ROAD	CAPACITY m <sup>3</sup> /s	DECK ELEVATION m AHD	LOCAL AUTHORITY
Twin Bridges	Wivenhoe Pocket Road	50	20.0	Somerset Regional Council
Fernvale Bridge	Brisbane Valley Highway	2000	33.8	Somerset Regional Council
Savages Crossing	Banks Creek Road	130	20.6	Somerset Regional Council
Burtons Bridge	E Summerville Road	430	19.6	Somerset Regional
Kholo Bridge	Kholo Road	550	11.9	Brisbane/Ipswich City Councils
Mt Crosby Weir	Allawah Road	1900	12.4	Brisbane/Ipswich City Councils
Colleges Crossing*	Mt Crosby Road	175		Brisbane/Ipswich City Councils



### **1. How the present height and condition of the bridges impinges upon the management of flood releases from the dams.**

While the bridges above the Dams do not significantly impinge on the management of the flood releases from the Dams, inundation of these bridges can significantly impact access upstream of the storages during major flood events.

The major bridges below Wivenhoe Dam across the Brisbane River have a range of flow capacities from 175 m<sup>3</sup>/s to 2000 m<sup>3</sup>/s. These bridges are currently taken into consideration when making flood releases. The following specific matters are considered; the risk that downstream inflows in combination with flood releases will prematurely inundate a bridge, the timing of inundating the bridges, the length of time a bridge is to be inundated, the time it takes to ensure closures are effected and the impacts that this closure will have on communities.

The lower flow capacity bridges form points which require management as the flood rises and falls. A uniform bridge flow capacity would allow more flexibility in the early part of large flood events and during the drain down phase.

To effect an improved flood management outcome the two crossings at College's Crossing and Burtons Bridge could be raised to the equivalent flow capacity (2000 m<sup>3</sup>/s) of Fernvale Bridge and Mount Crosby.

### **2. How local communities are affected by the closure of the bridges because of flood releases from the dams.**

The key impacts are increased travel times and isolation of a community. Many local pockets can also be affected by concurrent local flooding that occurs during major flood events.

The community situated on the northern side of the Brisbane River between Burtons Bridge and Savages Crossing becomes isolated once the Burtons Bridge becomes inundated. The extended isolation is an issue for a number of its residents. Burtons Bridge has been upgraded since the construction of Wivenhoe Dam to its current flow capacity of 430 m<sup>3</sup>/s. The community would be isolated more frequently if Wivenhoe Dam was not in existence.

The travel times are increased for all the communities that use bridges closed by flood releases. The community that uses College's Crossing is however the most likely to be impacted most by flood releases due to extended drainage.

### **3. Whether the closure of the bridges because of flood releases from the dams creates any issues for emergency services.**

The bridge closure can increase the response time of some emergency services.

Once Burtons Bridge is inundated there is no sealed road access for Emergency Services to the community situated on the northern side of the Brisbane River between Burtons Bridge and Savages Crossing.

In general, widespread flooding is occurring when releases or flows in the Brisbane River below Wivenhoe Dam exceed 2000 m<sup>3</sup>/s. Local flooding will also create local access issues.

**4. Whether there are presently any plans to upgrade any of the bridges.**

DERM is not aware of any current plans to upgrade any of the bridges.

**5. Whether there are presently any plans to develop alternate routes to any of the bridges.**

DERM is not aware of any current plans to upgrade any of the routes.

**6. Whether the State Government has been working with any local council to develop plans to upgrade any of the bridges or develop alternate routes.**

DERM is not aware of any current plans to upgrade any of the bridges or routes.

## **Office of the Coordinator-General**

### **Background**

1. The Coordinator-General has been invited to respond to the *Invitation for submissions about bridges mentioned in the Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam (Request for Submissions)*.
2. In the *Queensland Government response to the Floods Commission of Inquiry Interim Report (Response)*, the Queensland Government committed to undertaking a study to investigate options to increase the flood mitigation performance of Wivenhoe Dam. At page 5 of the Response, it is noted that:  
  
*"The Queensland Government is also undertaking a scoping study to investigate options to increase the flood mitigation performance of Wivenhoe Dam. By November 2011, the Queensland Coordinator-General will have completed a short term assessment of the options including raising the dam wall to increase the flood storage compartment. Seqwater will conduct a long term study which is expected to be complete by mid 2013."*
3. The Coordinator-General is tasked with the responsibility of coordinating and commissioning the short term assessment study.

### **Short Term Assessment Study - Scope**

4. The Coordinator-General prepared an invitation to offer for services to investigate and identify a preferred option (or options) to increase the mitigation of floods downstream of Wivenhoe Dam including consideration of a raising of the dam wall to increase the flood storage compartment.
5. It is proposed that two studies (together the *Short Term Assessment Study*) will be run concurrently to assess options to improve the mitigation of flood impacts:
  - (a) a Wivenhoe Dam Study considering options for various raisings of the dam wall height/increased flood compartment size and increasing and reducing the full supply level
  - (b) a Preliminary Optimisation Study seeking to identify various scenarios for flood mitigation that include modified operations of Wivenhoe Dam and other measures.
6. Part B of the Study requires the development and assessment of various flood mitigation and

water supply security scenarios comprising infrastructure and non-infrastructure measures.

7. Relevantly for the Request for Submissions, the study will consider a variety of infrastructure options as rudimentary cost / benefit comparators to that of raising the Wivenhoe Dam Wall. One such comparator will include the likely benefits arising from changes to downstream bridge crossings. DTMR, via its current planning study, will guide the high level data included for this preliminary comparator assessment.
8. Part B of the study will also assess the:
  - (a) flood mitigating benefit of the option and its financial, social and economic benefits
  - (b) cost of implementation relative to a status quo scenario including consideration of financial, social and environmental costs
  - (c) effects of the option on other significant matters such as regional water security
  - (d) risks to successful implementation and realising the full benefits
  - (e) time and resources required to implementation.

#### **Current Status of the Study**

9. The Invitation to Offer was issued by the Coordinator-General on 2 September 2011.
10. The Invitation to Offer closed on Monday 12 September 2011. The Coordinator-General will then undertake an evaluation of the offers with a view to awarding the contract which commenced on 12 September 2011.
11. A draft study report detailing the results of the analysis of all options including their flood mitigation performance is to be submitted to the Coordinator-General by mid November, with the report to be finalised by the end of November 2011.
12. Subject to consideration by government of the results of the investigations, detailed planning and assessment of the preferred options may then be commissioned.
13. Seqwater is to undertake a long term comprehensive optimisation study of the operation of the Wivenhoe and Somerset Dam system for both water supply and flood mitigation (*Wivenhoe and Somerset Dam Optimisation Study*).
14. Any relevant preliminary findings from Short Term Assessment Study may be incorporated into the Seqwater Wivenhoe and Somerset Dam Optimisation Study.

#### **Department of Community Safety**

The restricted access of any bridge has the potential to create difficulties or delays for emergency services responding to incidents and also for re-supply and evacuation purposes.

Whilst it is accepted, and perhaps unavoidable, that there will be closures of bridges from time to time as part of a planned flood release of a dam, the most critical issue is for emergency services to be notified prior to such a planned release.

With prior warning, emergency services will be able to inform operational staff of the occurrence and implement other contingency planning arrangements such as the relocation of resources and a change to the response protocols at the Communication Centres.

This can only be achieved by a detailed and documented notification process that will provide timely information from the Dam Operator to the correct areas in each department e.g. Fire, Ambulance, Police, Local Councils etc.

**Attachment A**

**Bridges listed per Appendix K of the manual of Operational procedures for Flood Mitigation at Wivenhoe Dam and Somerset dam**

**APPENDIX K  
BRIDGES IMPACTED BY FLOOD RELEASES AND ELEVATED STORAGE  
LEVELS**

<b>BRIDGES IMPACTED BY ELEVATED STORAGE LEVELS IN SOMERSET DAM</b>			
<b>BRIDGE NAME</b>	<b>ROAD</b>	<b>BRIDGE DECK ELEVATION (m AHD)</b>	<b>LOCAL AUTHORITY</b>
Mary Smokes Creek	D'Aguilar Highway	102.81	Somerset Regional
Kilcoy Creek	D'Aguilar Highway	104.76	Somerset Regional
Beam Creek	Esk Kilcoy Road	106.52	Somerset Regional
Scrubby Creek	D'Aguilar Highway	107.60	Somerset Regional
Oakey Creek	Esk Kilcoy Road	108.55	Somerset Regional

<b>BRIDGES IMPACTED BY ELEVATED STORAGE LEVELS IN WIVENHOE DAM</b>			
<b>BRIDGE NAME</b>	<b>ROAD</b>	<b>BRIDGE DECK ELEVATION (m AHD)</b>	<b>LOCAL AUTHORITY</b>
Sandy Creek A&PM Conroy Bridge	Wivenhoe Somerset Road	69.61	Somerset Regional
Deep Creek	Wivenhoe Somerset Road	72.95	Somerset Regional
Kipper Creek	Wivenhoe Somerset Road	73.00	Somerset Regional
Meirs Gully	Esk Kilcoy Road	74.63	Somerset Regional
Tea Tree Creek	Brisbane Valley Highway	74.82	Somerset Regional
Logan Creek	Brisbane Valley Highway	74.88	Somerset Regional
Five Mile Creek	Brisbane Valley Highway	75.81	Somerset Regional
Reedy Creek	Wivenhoe Somerset Road	75.90	Somerset Regional
Stanley River Haslingdens Bridge	Esk Kilcoy Road	76.25	Somerset Regional
Coal Creek	Brisbane Valley Highway	76.51	Somerset Regional
Brisbane River O'Sheas Bridge	Esk Kilcoy Road	76.98	Somerset Regional
Tea Tree Gully	Brisbane Valley Highway	77.90	Somerset Regional
Middle Creek	Wivenhoe Somerset Road	78.70	Somerset Regional

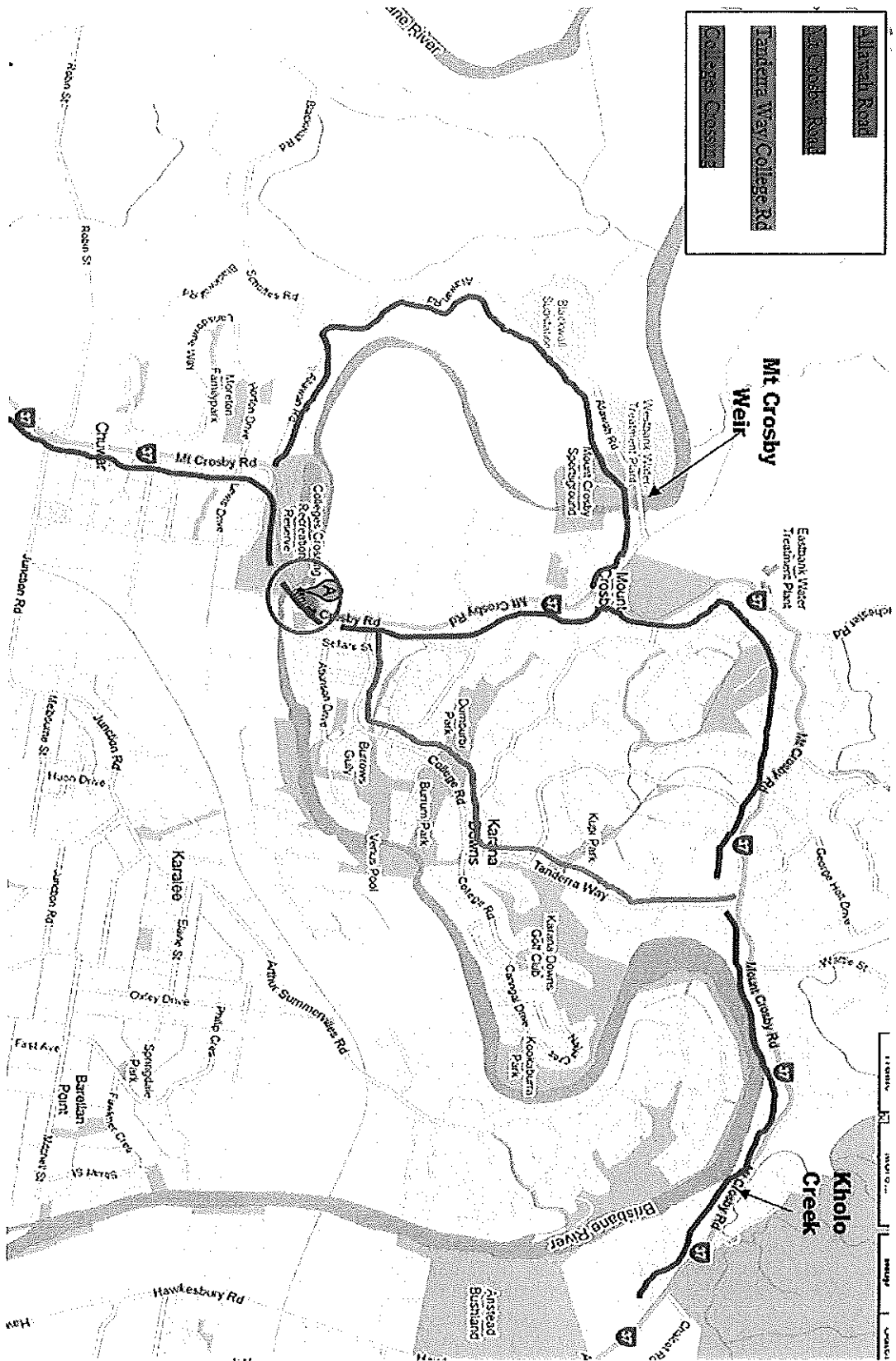
<b>BRIDGES IMPACTED BY FLOOD RELEASES FROM WIYENHOE DAM</b>			
<b>BRIDGE NAME</b>	<b>ROAD</b>	<b>SUBMERGENCE FLOW AND BRIDGE DECK ELEVATION</b>	<b>LOCAL AUTHORITY</b>
Twin Bridges	Wivenhoe Pocket Road	50 m <sup>3</sup> /s 20.0 m AHD	Somerset Regional
Savages Crossing	Banks Creek Road	130 m <sup>3</sup> /s 20.6 m AHD	Somerset Regional
Colleges Crossing*	Mt Crosby Road	175 - 200 m <sup>3</sup> /s	Brisbane/Ipswich City Councils
Burtons Bridge	E Summerville Road	430 m <sup>3</sup> /s 19.6 m AHD	Somerset Regional
Kholo Bridge	Kholo Road	550 m <sup>3</sup> /s 11.9 m AHD	Brisbane/Ipswich City Councils
Mt Crosby Weir	Allawah Road	1900 m <sup>3</sup> /s 12.4 m AHD	Brisbane/Ipswich City Councils
Fernvale Bridge	Brisbane Valley Highway	2000 m <sup>3</sup> /s 33.8 m AHD	Somerset Regional

\* Affected by tidal flows.



Attachment B

State and Local network surrounding College's Crossing



Annexure C

Colleges crossing signage layout

