QFCI

Date: 16/05/11 JM

Exhibit Number: 394

Department of Environment and Resource Management – Parliamentary Briefing Note

To Minister Robertson

Prepared for Parliamentary sittings 15-17 February 2011

WIVENHOE DAM operations in relation to the January 2011 flood event

KEY POINTS

- Wivenhoe and Somerset Dams can only help manage the flood waters from the Upper Brisbane, which comprises of approximately 50% of the total Brisbane River catchment.
- Based on the Brisbane City Council flood damage model, without Wivenhoe Dam, up to 13,000 more houses may have been flooded and major flooding may have lasted up to three days longer. It is estimated Wivenhoe Dam may have prevented up to $1.6 billion of damages.
- Wivenhoe and Somerset Dams are required to operate during a flood event strictly in accordance with Manual of Operational Procedures for Flood Mitigation, which is approved by the Office of the Dam Safety Regulator.
- The Government announced Commission of Inquiry will examine the management of Wivenhoe Dam during the flood event and whether any operational improvements are required into the future.

RESPONSE

Contact: Mike Foster
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Date: 10 February 2011
CTS No.

Approved: Peter Borrows, CEO Seqwater
Approved:
Approved:

- From 13 December 2010 to 11 January 2011, South East Queensland experienced unprecedented rainfall, which resulted in a number of controlled flood gate releases from Wivenhoe, Somerset and North Pine Dams.
- The rainfall over this period culminated in the January 2011 flood event.
- During the event Seqwater advises Wivenhoe and Somerset dams helped to manage flood waters from the upper Brisbane catchment by controlling the release of 2,650,000 million ML of flood water. This is 1,240,000 million ML more than the 1974 floods.
- Seqwater estimates that the management of Wivenhoe Dam during the flood event resulted in reduction of flood peak of up to 2.5 metres in the Brisbane CBD.
- Seqwater is required to operate Wivenhoe, Somerset and North Pine dams in accordance with a range of regulatory requirements including the flood mitigation strategies contained within the Manuals of Operational Procedures for Flood Mitigation.
- Seqwater has a Dam Safety Management Program approved by the State's Dam Safety Regulator, as well as a Flood Control Centre.
- The Manuals and their operating procedures have been reviewed by some of Australia's best water experts and are

based on detailed hydrological analysis and technical assessments of dam safety.

- The Government announced a Commission of Inquiry on 17 January 2011 to examine the management of Wivenhoe Dam over this period and whether any operational improvements are required into the future.
- Seqwater is required by the Office of the Dam Safety Regulator to provide a detailed report within six weeks of the January flood event.
- This report, once finalised, will also be provided to the Commission of Inquiry.
- Seqwater is also currently undertaking a process to identify whether any damage has been sustained to its infrastructure as a result of the flood event. As part of this process, and as a matter of urgency, dam and weirs are being inspected by independent experts to determine the structural integrity of that infrastructure.
- Seqwater has advised that the structural integrity of Wivenhoe, Somerset and North Pine Dams remains intact.
- Seqwater is currently undertaking small operational releases from both Somerset and Wivenhoe.
- The Grid 12 dams are currently at 100% combined capacity with Wivenhoe, Somerset and North Pine Dams all at about

100% capacity. **(dam levels to be updated on Tuesday 15 February 2011 am)**

- On Sunday 13 February I announced the State Government had received and accepted a recommendation from Seqwater to temporarily reduce Wivenhoe Dam levels to 75% of the Full Supply Level (FSL) for the remainder of the wet season.
- The recommendation balanced the region's drinking water security and flood mitigation and was based on Seqwater modelling which was peer reviewed by external experts.

BACKGROUND

Ability for Wivenhoe and Somerset dams to manage floods in the Brisbane River

- There are 4 major catchments that impact on flooding in Brisbane (Upper Brisbane, Lockyer; Bremer and local creeks).
- The contribution of each of these individual catchments depends on where the rain falls.

Impacts of Wivenhoe and Somerset Dams

- During the January 2011 flood event, it is estimated that Wivenhoe Dam reduced the flood peak by up to 2.5 metres in the Brisbane CBD.
- During the flood event controlled 2,650,000 mega litres (ML) of floodwater passed through Wivenhoe and Somerset Dams. This is 1,240,000 ML more than in 1974.
- Highest flow rate in the Brisbane River in the city in 1974 has historically been accepted as 9,500 cubic metres per second (this may be reassessed at some stage).
- The estimated flow from this event may have been up to 4,500 cubic metres per second greater if Wivenhoe Dam did not exist.

Operation of Wivenhoe and Somerset dams

- Detailed Operational Procedures for flood mitigation have been developed by leading water experts over many years.
- The clear decision making process in the Manual has been established since 1992. Subsequently, the Manual was reviewed during the Brisbane Valley Flood Damages Minimisation Study in 2006, with the latest comprehensive review of the Manual undertaken in 2009. Both of these reviews have included expert review panels comprising key stakeholders, with the most recent review involving representatives from DERM, BOM, BCC and SunWater.

Rainfall forecasts

- There is a significant element of uncertainty in rainfall forecasting, even though the Bureau of Meteorology uses the best technology available, and highly-qualified and experienced experts.
- Wivenhoe and Somerset dam operations were based on forecasts provided by the Bureau of Meteorology and observed rain on the ground.
- The rainfall during the critical period of this event significantly exceeded the Bureau of Meteorology forecasts.

Large releases earlier

- Releasing large volumes of water over the weekend prior to the 11 January 2011 event would have had major impacts on the rural communities of the Brisbane Valley. Bridges would have been cut and communities would have been isolated with little notice.
- Such a release of large volumes of water at that time would have not been accordance with the strategies detailed in the Manual.
- Over the weekend, neither rainfall forecasts nor the observed rain on the ground indicated that urban areas would be impacted.

Increases above 200% (level of fuse plugs)

- Wivenhoe Dam is not designed to overtop. If it did, the dam would fail and the resulting damage and loss of life could be as much as 100 to 1,000 times greater than that currently being experienced.
- To prevent overtopping, the dam has been designed with fuse plugs, the first one opens when it reaches just more than 200% of the FSL.
- Once opened, the rate of release through these plugs cannot be varied. Although through the use of the flood gates, by either increasing or decreasing gate releases, the total volume being released from the dam can be varied.
- The plugs continue to release water at this rate until the dam reduces to full supply level.
- Seqwater managed to control the flood releases during the January 2011 event to avoid initiating the fuse plugs
- The fuse plugs would take four to six months of dry weather to repair, and severely restrict the capability to manage further flood events during this period.
- In accordance with the Manual, flood operations are managed to ensure a flood buffer still exists to allow for possibilities of further extensive inflows.