Queensland Floods Commission of Inquiry
Level 30 400 George Street
BRISBANE QLD 4000

L111118_111024

3 February 2012

Attention: Ms Susan Hedge

Dear Susan,

RE: Clarification of Scenario C and Additional Modelling

1 We refer to the Commission's request for WMAwater to provide clarification in relation to the hypothetical Scenario C documented in WMAwater's *Review of Hydraulic Modelling Final Report* (the WMAwater report, Reference 1), and to undertake modelling of additional scenarios relating to operational management of Wivenhoe Dam during the January 2011 Brisbane River flood.

2 Specifically, the Commission requested a written report addressing the following:

i. *For scenario C in your report of 28 July 2011* [Reference 1]*, could you provide*:

- *Time and date of transitioning to W2 (if used), W3 and W4*
- *Detailed tables for Wivenhoe dam, hour by hour, of inflow, outflow (releases), lake level and gate openings, future flow at Lowood/Moggill caused by the releases in that hour*
- *Details of any other assumptions you made relevant to Scenario C.*

ii. *Model the effects downstream in the Brisbane River of employing strategy W3 at 8am on 8 January 2011 in the following ways:*

A. *increase releases at 8am, 8 January 2011 with maximum gate openings to the rate that will produce a flow at Moggill of 4000 cumecs* [WMAwater Scenario G1]

B. *increase releases at 8am, 8 January 2011 with maximum gate openings to 4000 cumecs* [WMAwater Scenario G2]

In both A and B, implement strategy W4 as soon as the lake level rises above 74.0 metres AHD and then open the gates continuously until the lake level begins to fall in accordance with the manual (p29).

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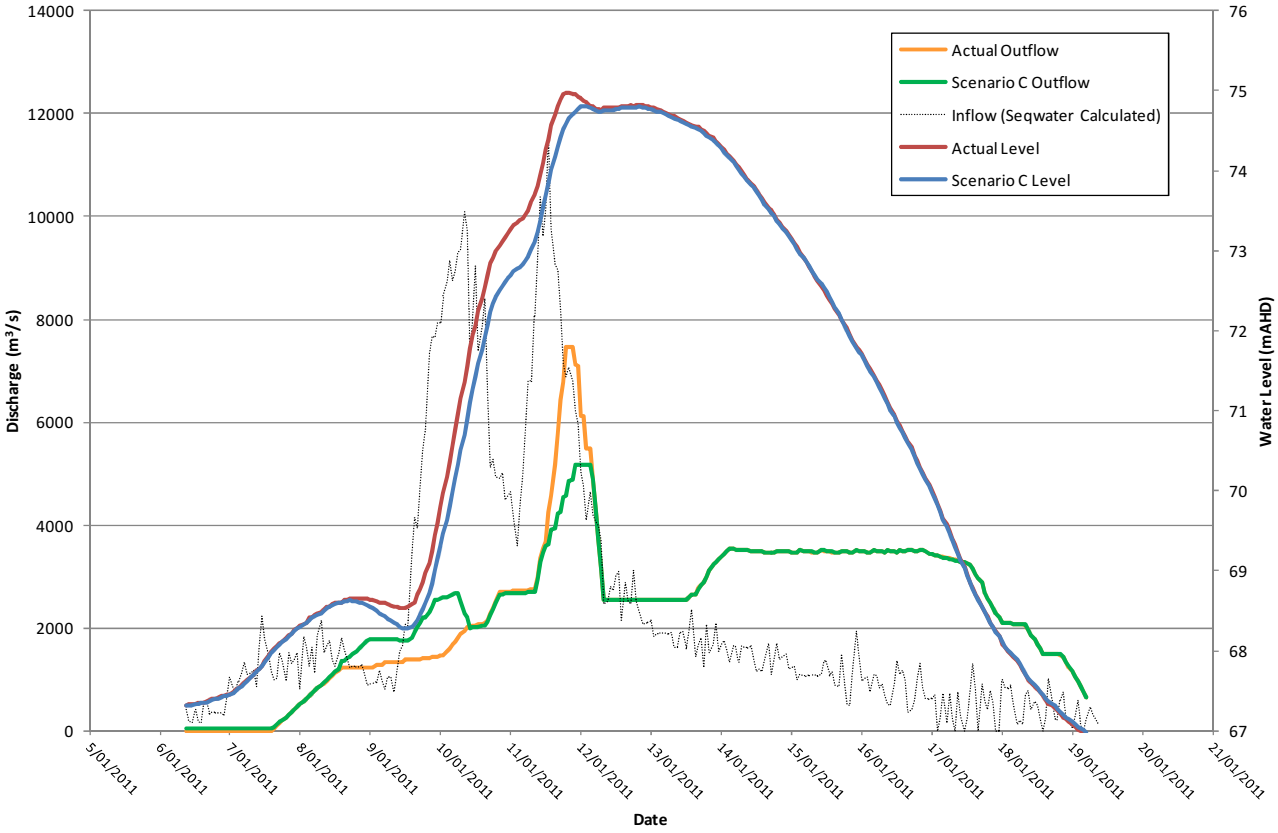
Clarification of Scenario C

3 Modelling of Scenario C was undertaken as part of WMAwater's report to the Commission in July 2011 (Reference 1). A full table of relevant variables relating to Scenario C, hour by hour, is attached at the end of this document. The table includes lake levels, estimated inflows, dam releases, gate opening settings, and the predicted total peak flows at Lowood and Moggill estimated to result from releases up to and including that hour.

4 Illustrations of the tabulated information are provided in Figure 1 to Figure 3 below. Figure 1 shows dam inflows, outflows and dam water levels as they occurred during the event and for Scenario C.

Figure 1: Scenario C Wivenhoe Dam Releases and Water Levels



5 Figure 2 and Figure 3 shows the Scenario C dam releases over time, as well as the corresponding predicted peaks for flow at Moggill at each point in time. The predicted peaks are based on the operational spreadsheets used by Seqwater during the flood, which were provided to WMAwater by the Commission. Different predicted peaks are obtained depending on whether forecast rain information is included. It is important to note that this chart indicates the predicted peak expected during the flood as estimated using Seqwater's operational spreadsheets with information available at the time, and not the actual flow at Moggill at that time.

Figure 2: Scenario C – Predicted Peak Flows at Moggill

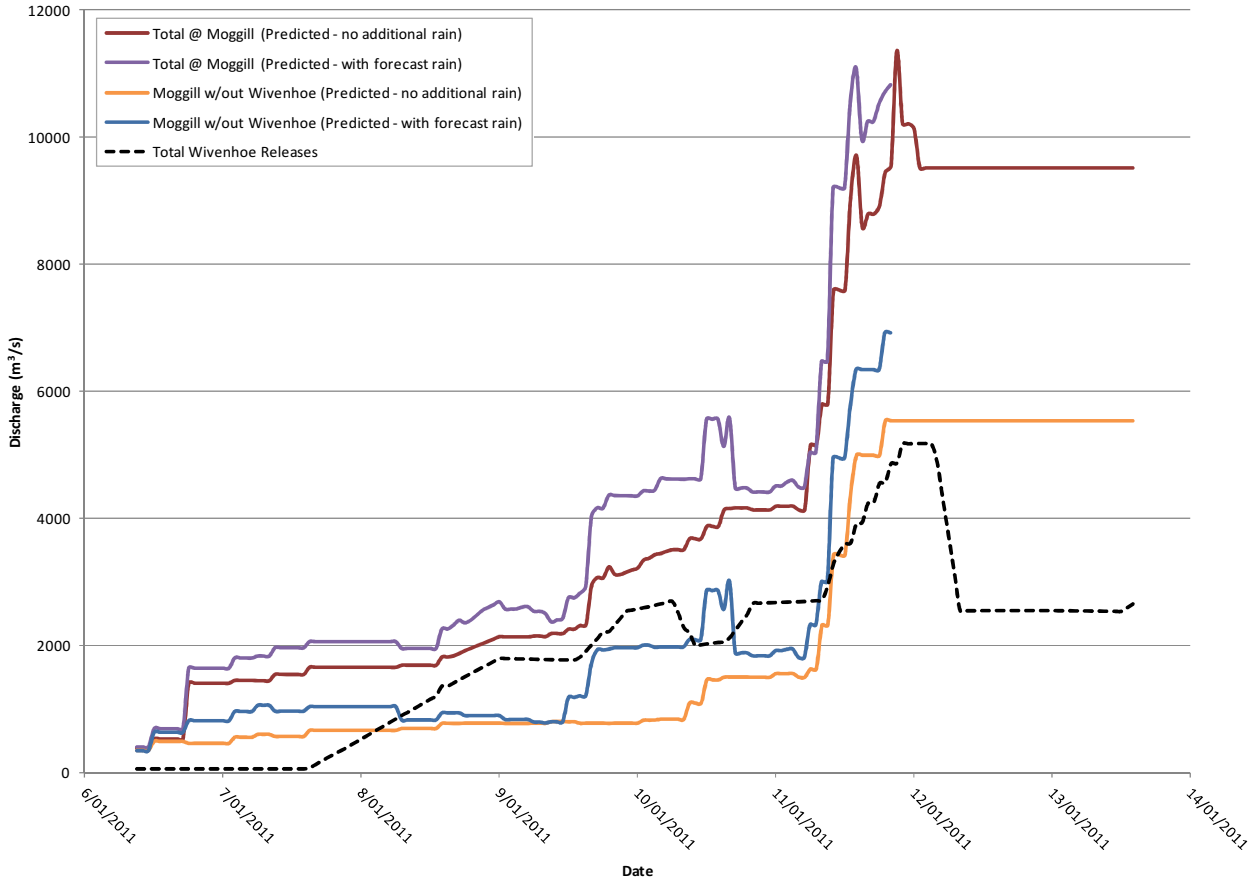
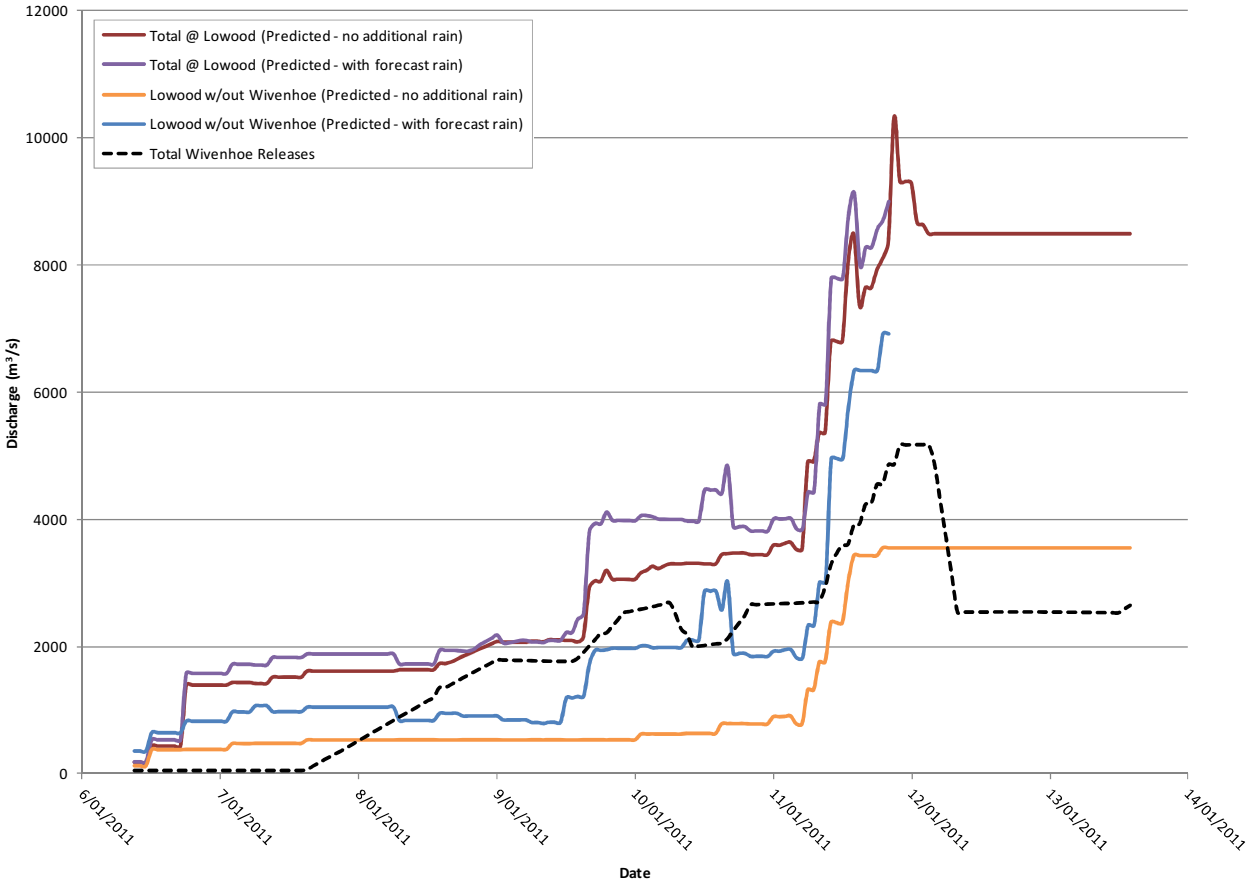


Figure 3: Scenario C – Predicted Peak Flows at Lowood



6 The dates and times of transitioning between operational strategies for Scenario C are as follows:

i. At 8:00am on 8 January 2011, the Wivenhoe Storage Level exceeds 68.5 mAHD, requiring initiation of either Strategy W2 or W3 as per the direction on page 26 of the Manual.

ii. Strategy W2 is bypassed and Strategy W3 is initiated, as the dam releases already exceed the estimated natural peak flow at Lowood and Moggill, even considering forecast rainfall (refer to Table 2)

iii. Strategy W4 is initiated at 8:00 am on 11 January 2011, the estimated inflows to the Dam exceed 8,000 m^3/s and are rising, and the water level in Wivenhoe Dam is 73.1 mAHD and rising at roughly 0.1 m per hour, suggesting that a dam level exceeding 74.0 mAHD will occur, and a fuse plug may be breached if releases are not increased significantly.

7 Strategies W2 and W3 have very similar objectives. Although Strategy W3 would be implemented at 8:00 am on 8 January under Scenario C, there are grounds for maintaining consideration of the Strategy W2 maximum total flow targets for Lowood and Moggill of 3,500 m^3/s and 4,000 m^3/s respectively. Although Strategy W3 allows releases above this level, the primary consideration of the strategy is "protecting urban areas from inundation" and that "the flow at Moggill is to be kept as low as possible" (p28, Reference 8). There is also a directive that "Lower level objectives are still considered."

8 While the Manual stipulates that "4,000 m^3/s at Moggill is the upper limit of non-damaging floods downstream," flood damages would realistically be expected to occur at lower flows. Flood damages tend to increase continuously with rising water level, rather than having stepped increases at given levels. While the Manual indicates that flows above 4,000 m^3/s should be avoided, damages from flooding to rural areas and some lower-lying urban areas would still be expected to occur at lower flows.

9 Strategies W2 and W3 have very similar goals. For the period from 8 January to early afternoon on 9 January, the maximum total flow predicted to occur at Moggill remains below 2,500 m^3/s under Scenario C (refer to Figure 2). Under Scenario C therefore it was considered reasonable to maintain a maximum target flow for Moggill at around 2,500 m^3/s, and 2,000 m^3/s for Lowood, bearing in mind the objectives of both Strategy W2 and W3.

10 Under Scenario C, the point at which it becomes unreasonable to maintain consideration of the lower level Strategy W2 objectives is at 2:00 pm on 9 January 2011, at which time there is a significant jump in the total predicted peak flow for Moggill (refer to Figure 2), with or without consideration of forecast rainfall. At this point in time, it appears reasonable to expect that a peak flow of 3,500 m^3/s at Lowood and 4,000 m^3/s may be exceeded.

Additional Modelling Scenarios

11 As requested by the Commission, WMAwater modelled the effects of two additional Wivenhoe Dam release scenarios, to determine the impacts at various locations downstream relative to what actually occurred. The additional scenarios are named as follows (to avoid confusion with scenarios from previous reports):

i. Scenario G1 – Strategy W3 is invoked at 8:00 am on 8 January 2011, and the gates are opened as fast as permitted by the Manual to produce a dam release that results in a predicted total flow at Moggill of 4000 m^3/s, using information available at the time (but not including forecast rain).

ii. Scenario G2: - Strategy W3 is invoked at 8:00 am on 8 January 2011, and the gates are opened as fast as permitted by the Manual to maintain a dam release of 4,000 m^3/s.

12 In practice, the prescribed strategy for Scenario G1 results in releases being increased rapidly from 940 m^3/s at 8:00 am to 3,340 m^3/s at 4:00 pm on 8 January. From this point, the discharge from the dam would have to be steadily reduced to maintain the target peak flow of 4,000 m^3/s at Moggill, due to increases in the predicted flows from other tributaries as the flood progressed. To achieve this reduction, the gate openings would be held at constant opening widths, but the discharge from the dam would have steadily reduced as a result of the falling lake level. Information for Scenario G1 is shown on Figure 4 and Figure 5 below.

Figure 4: Scenario G1 Wivenhoe Dam Releases and Water Levels

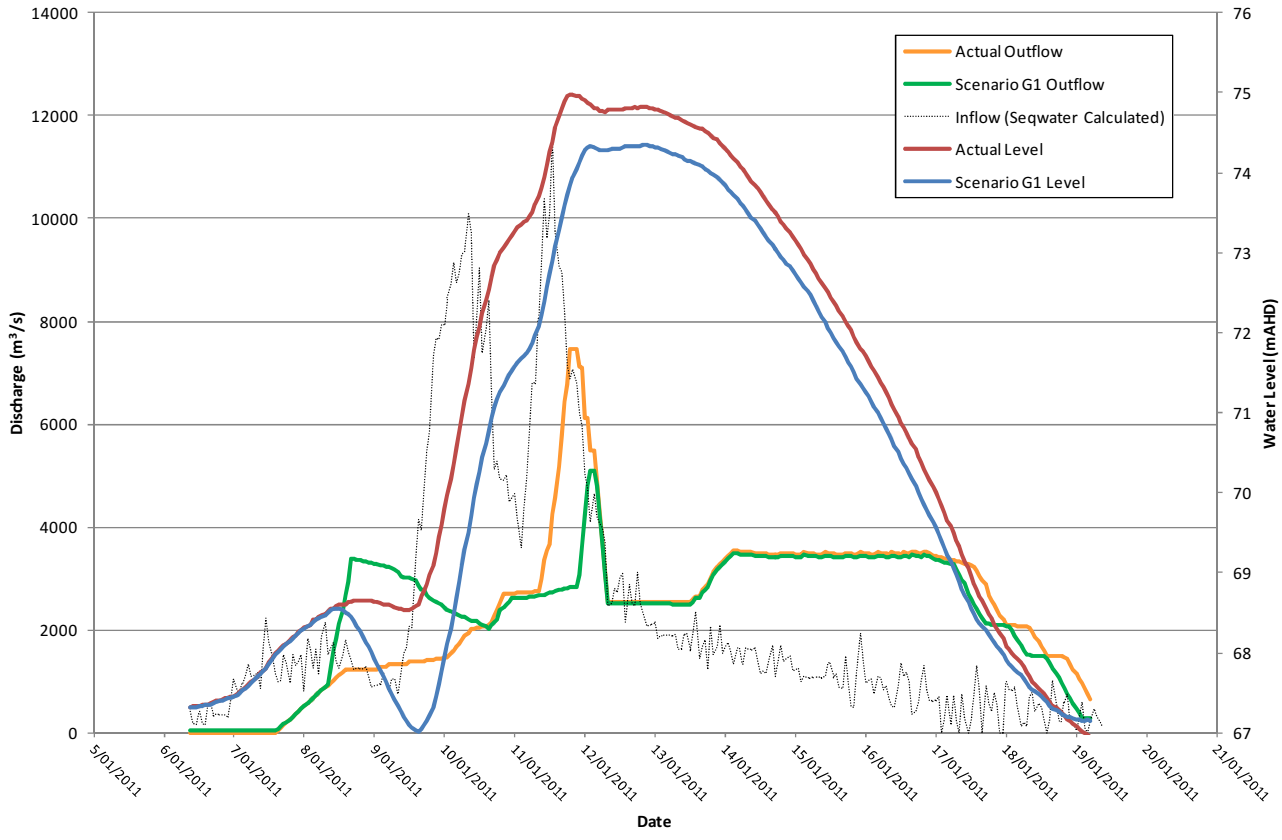
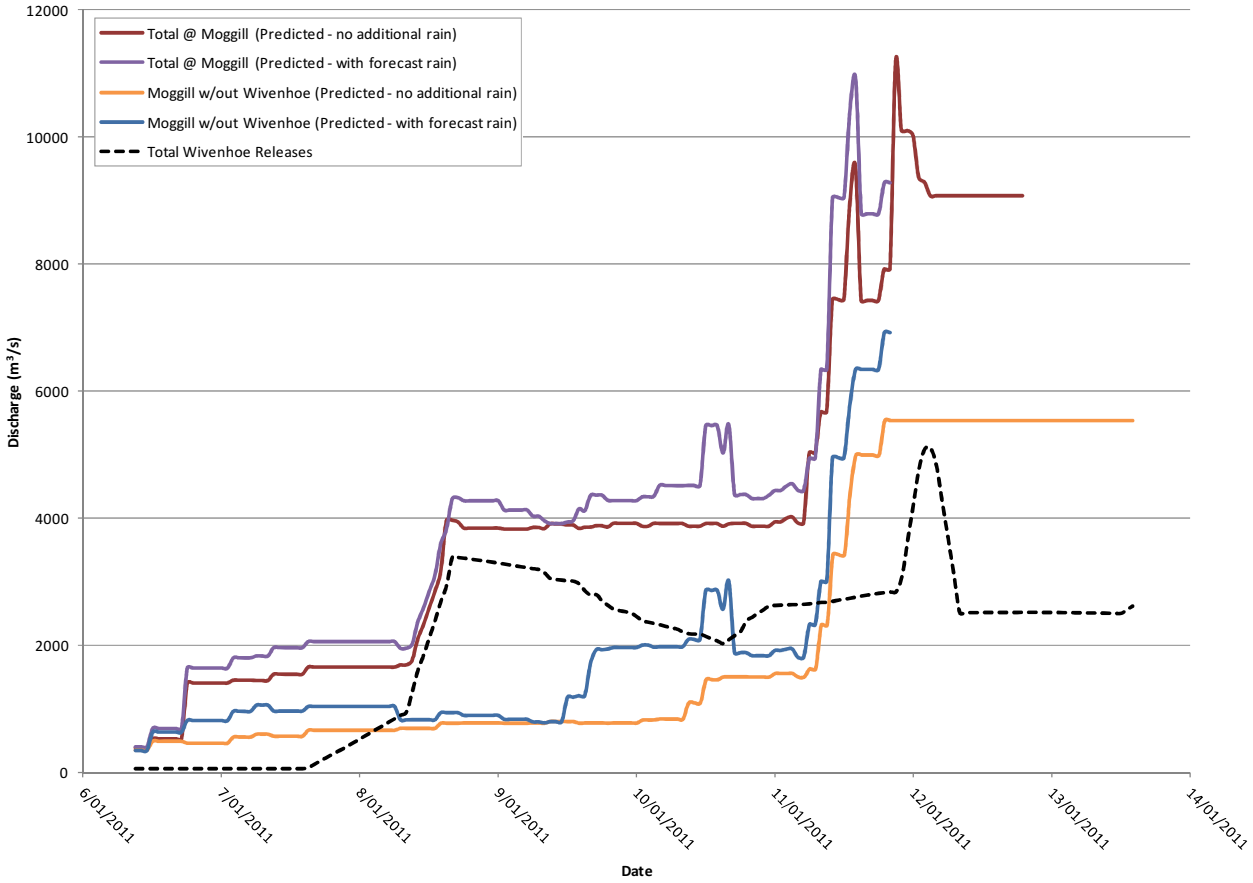


Figure 5: Scenario G1 – Predicted Peak Flows at Moggill



13 Under Scenario G1, the Wivenhoe Dam level would have exceeded 74.0 mAHD at around 9:00 pm on 11 January. Gate openings at the intervals specified on page 32 of the Manual are initiated until the lake level begins to fall, in accordance with Strategy W4A on page 29 of the Manual.

14 Relevant information for Scenario G2 is provided on Figure 6 and Figure 7.

15 Figure 6 shows that under Scenario G2, dam releases would have increased rapidly from 940 m^3/s at 8:00 am to 4,000 m^3/s at 6:00 pm on 8 January. Releases of 4,000 m3/s are then maintained, except for a dip to around 3,500 m3/s between 8:00 am to 11:00 pm on 9 January. The reason for the dip is that during this period the lake level drops below Full Supply Level and there is insufficient head to drive releases of 4,000 m^3/s from the dam (blue line, Figure 6).

16 The sustained release of 4,000 m^3/s under Scenario G2 is enough to prevent the Wivenhoe Dam level rising above 74.0 mAHD, and Strategy W4 is therefore not triggered under this scenario. The maximum lake level is 72.3 mAHD at 9:00 pm on 12 January (Figure 6).

Figure 6: Scenario G2 Wivenhoe Dam Releases and Water Levels

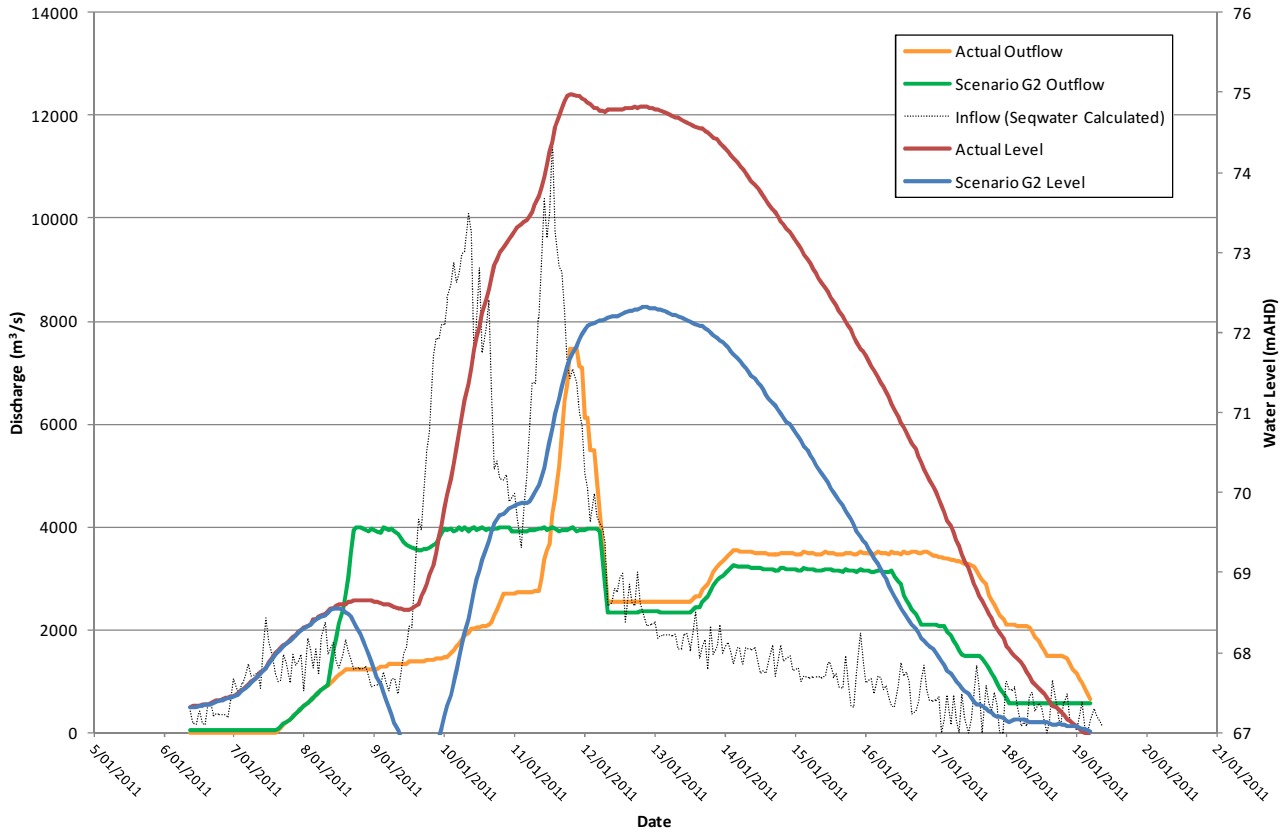
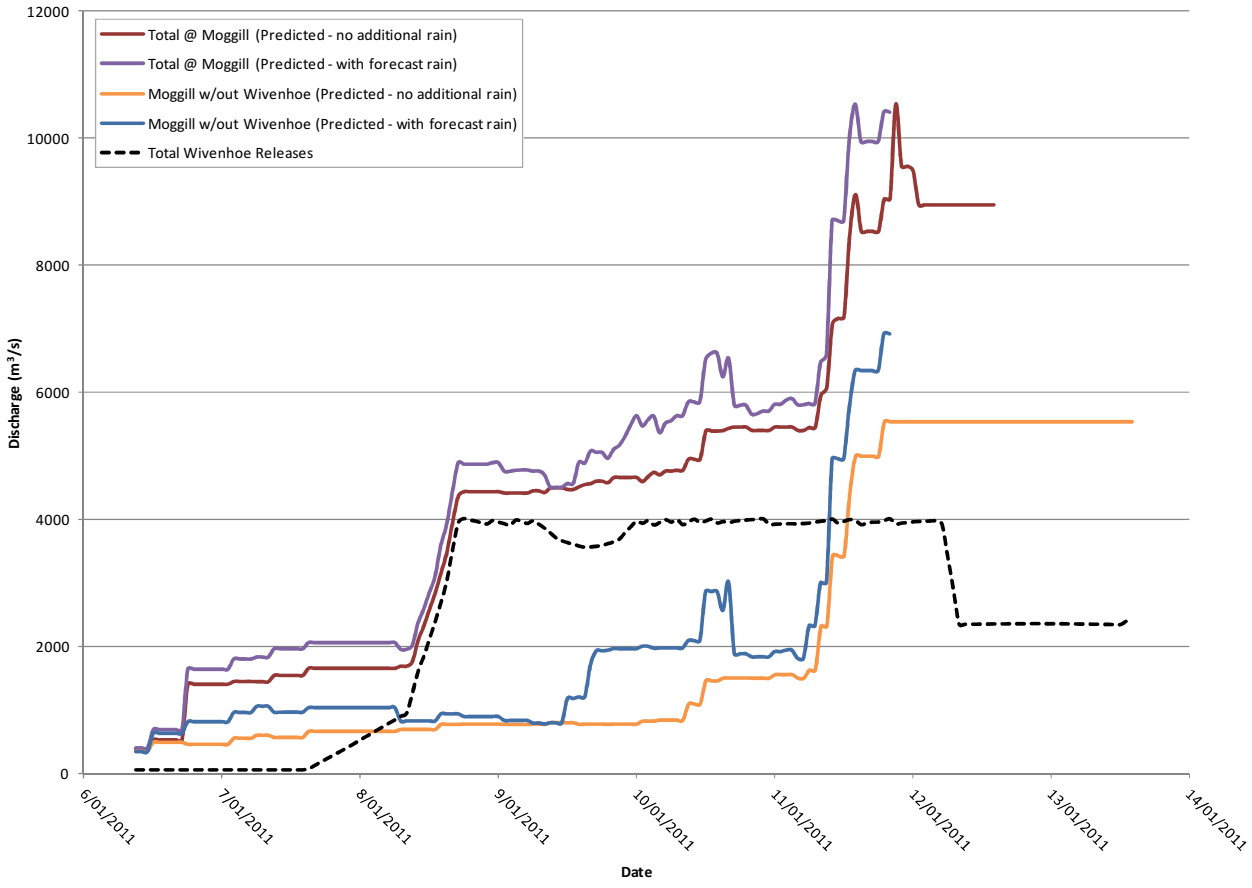


Figure 7: Scenario G2 – Predicted Peak Flows at Moggill



Modelling Results

17 Modelled flood levels at key locations for each scenario are presented Figure 9, with the peak comparisons given in Table 1 below. Results for Scenarios C and D from Reference 1 are also included. A negative value of "Peak Flood Level Difference" for a given scenario indicates a benefit (i.e. a reduction in flood levels compared to what actually occurred).

Table 1: Alternative Dam Operation Results

Location	Case 1	Scenario C	Scenario D	Scenario G1	Scenario G2
	Peak Flood Level (mAHD)	Peak Flood Level difference relative to Case 1 (m)			
Moggill	17.6	-0.7	-0.9	-1.3	-1.0
Jindalee	13.1	-0.6	-0.8	-1.2	-0.8
Oxley	8.3	-0.5	-0.6	-0.9	-0.6
Brisbane	4.6	-0.3	-0.4	-0.6	-0.3

18 Note that both Scenario G1 and G2 result in a lower flood level at some locations than Scenario D, which was an optimised strategy using hindsight presented in Reference 1. The primary reason for this difference is that Scenario D does not incorporate releases greater than the inflows (Figure 8). This issue is discussed further below.

Figure 8: Scenario D Wivenhoe Dam Releases and Water Levels (from Reference 1)

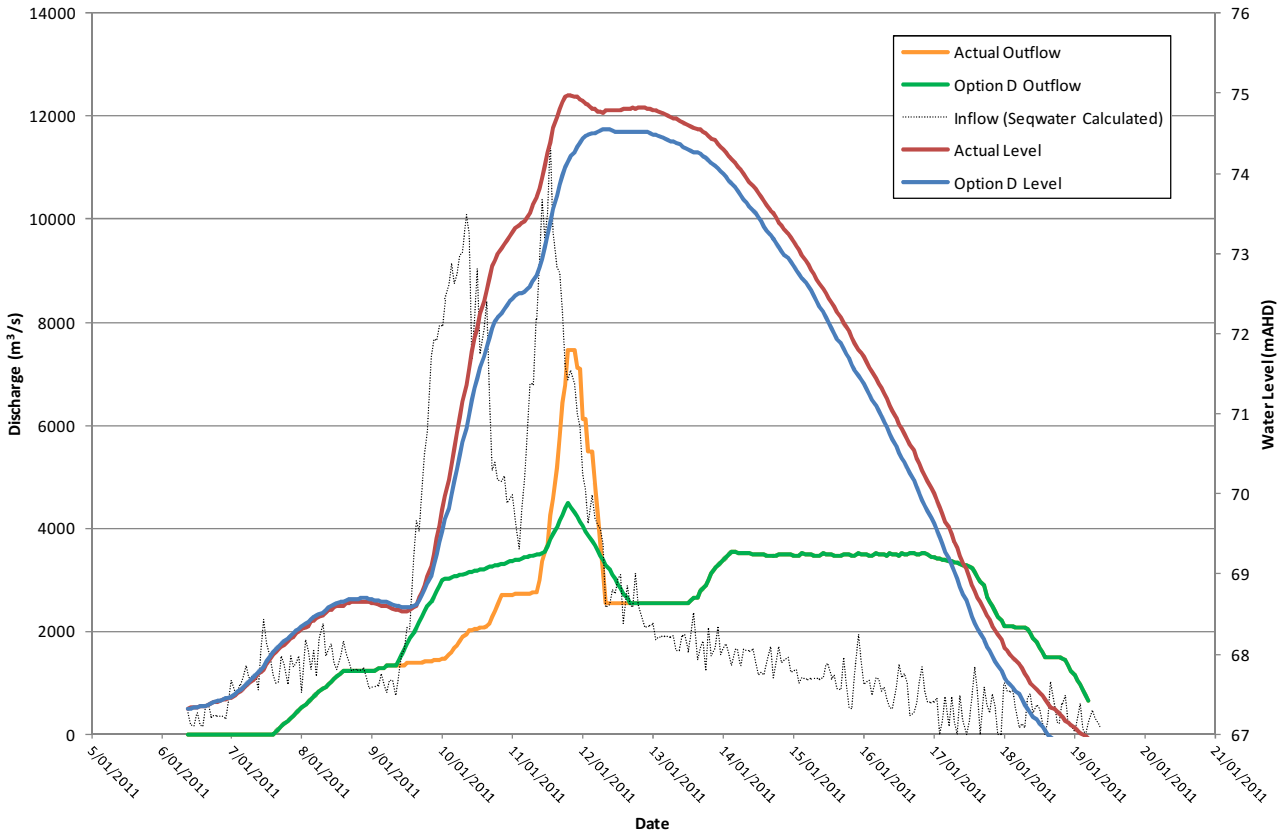
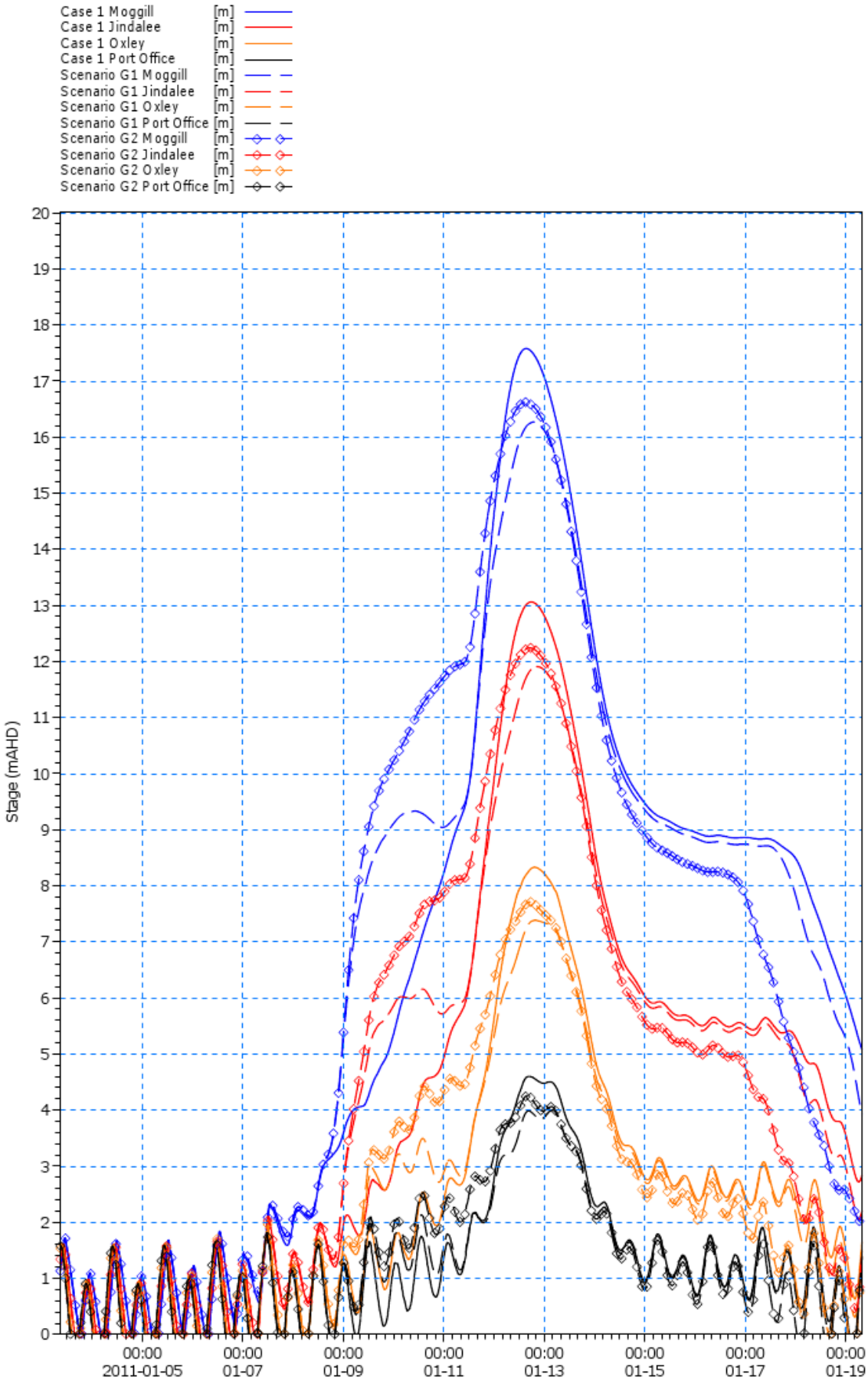


Figure 9: Modelled Flood Level Hydrographs for Base Case and Scenarios G1 and G2



19 Each of the scenarios considered above result in a significant reduction in peak outflow from the dam. In the case of Scenario G2 the peak outflow is less than for G1 (4,000 m^3/s in G2 compared to 5,100 m^3/s in G1, compared to 7,500 m^3/s for the actual event). Yet Scenario G2 produces higher peak flood levels at the locations investigated than Scenario G1. At first glance this may seem an unreasonable conclusion; however it is because several other factors apart from the peak dam release are important in influencing the eventual peak flood levels downstream. These other factors include the total flood volume released, the length of time during which sustained large releases occur, and the timing of the releases in terms of their interaction with downstream tributary flows.

20 Compared to Scenario G1, the Scenario G2 releases are less favourable in terms of avoiding coincident high flows with downstream tributary peaks. The Scenario G1 releases are significantly lower during 10 January and early 11 January, which was a critical time with regards to timing with downstream tributary flows. Additionally, Scenario G2 has a more sustained period of elevated outflows prior to the peak. This is demonstrated in Figure 9, where flood levels rise earlier under Scenario G2 than the other cases.

21 The additional flow released earlier in the flood for Scenarios G1 and G2 would result in earlier rise of the river and filling of floodplain storage areas. Consequentially, a given peak outflow will produce higher flood levels than would otherwise have been the case. This effect becomes more pronounced further downstream from the dam. This is apparent from Table 1, where the benefits of peak flow reduction on peak flood levels are less at Brisbane than at Moggill. This phenomenon, together with the timing of releases with regard to downstream tributary flows, are major factors why even significant reductions in the peak flow (over 46% in the case of Scenario G2) do not necessarily result in corresponding reductions to the peak flood depth at downstream locations. The total volume of floodwaters released and the timing of releases both play a significant role in the eventual peak flood level outcomes.

Further Comments

22 WMAwater do not consider either of the two additional scenarios ("Scenario G1" or "Scenario G2") investigated above to be plausible release strategies. The primary factor when forming this view is that there would generally be no grounds to release large flows from Wivenhoe Dam during a flood event that are greater than the inflows so far received.

23 Between 11:00 am on 8 January and 1:00 pm on 9 January, both of these strategies would have involved dam outflows significantly in excess (almost double) the peak dam inflow observed until that point (compare the green line to the black dotted line in Figure 4). During this period, the above scenarios would have required Wivenhoe Dam to operate as a flood amplification dam rather than a flood mitigation dam. The only reason to increase flows so dramatically at such an early stage would have been if there was a sure indication that future inflows exceed the remaining flood mitigation space in the dam, and that storage capacity should be "created" for later.

24 Releasing 3,300 m^3/s from Wivenhoe Dam over a period of a day corresponds to just over 40 mm of runoff from the dam catchment of approximately 7,000 km^2 (noting that a greater depth of rainfall is required to produce 40 mm of runoff, due to infiltration etc.). Additionally the available dam storage for flood mitigation between 68.5 mAHD and 74.0 mAHD is 742,000 ML, which corresponds to approximately 105 mm of runoff from the dam catchment. Maintaining a release of 3,300 m^3/s over a period of 3 days therefore discharges a catchment average runoff of 120 mm. If the dam level is to increase from 68.5 mAHD to 74.0 mAHD during this period, then an additional 105 mm of runoff are required, for a total catchment average runoff of 225 mm over 3 days (or 305 mm over 5 days using the same calculations). The actual rainfall required to produce this runoff would be higher still.

25 Releasing more than 3,300 m^3/s from 11:00 am on 8 January (as per Scenarios G1 and G2 above) would have required the dam operators to gamble that over 225 mm of runoff would occur from the entire dam catchment in the next three days, or that 305 mm of runoff would occur in the next five days. These totals would be the amount of runoff required to bring the dam lake level up to 74.0 mAHD while making releases of this magnitude. At that point in time, both the 3-day and 5-day forecasts were for less than 200 mm of rainfall (Figure 4.3, Reference 10). At midday on 8 January, the 3-day and 5-day forecasts were both reduced to less than 150 mm. During the period in question (8 and 9 January), the extreme rainfall experienced in the dam catchment and Lockyer Valley on 11 January, which caused the second large inflow peak to the dam, was therefore not expected. Releasing 3,300 m^3/s from the dam at this time would have required an implicit assumption that 3-day and 5-day rainfall totals higher than the forecast were expected.

26 Without an expectation that the dam level would reach 74.0 mAHD, releases over 3,300 m^3/s would not therefore have been justified at that point in time (8 January 2011). If the additional rainfall did not eventuate, the accelerated release strategy would have significantly increased downstream flood damages in rural areas. Although hindsight indicates a better flood mitigation result could have been obtained by this course of action, it would have been unjustifiably risky using the information available at the time.

27 WMAwater consider it is unreasonable to consider release scenarios (such as Scenario G1 and G2) that require dam outflows to be escalated above inflows for a significant period as plausible alternative courses of action. To enact such strategies would have required foresight beyond that obtained from a measured consideration of weather forecasts.

28 In light of these considerations, WMAwater consider Scenario D to be a more plausible alternative strategy that is representative of a release sequence that might have been enacted, if there was an accurate and certain rainfall forecast available with a three-day horizon.

Reductions in Dam Level below 68.5 mAHD

29 Under Scenario G1, the dam level would have fallen to 67.02 mAHD (just above Full Supply Level) at 3:00 pm on 9 January. Under Scenario G2, the dam level would have fallen to 66.53 mAHD (below Full Supply Level) at 3:00 pm on 9 January. Scenario G1 and G2 both therefore result in the dam level dropping below 68.5 mAHD, which is the trigger level for shifting between Strategy W1 and Strategy W2 or W3.

30 It is not clear to WMAwater from the Manual whether dropping below 68.5 mAHD requires a shift back into Strategy W1. Given that further inflows to the dam were expected, and the Manual refers to a "likely" or "predicted" level of 68.5 mAHD when considering the application of Strategy W1 (pages 23 and 28 of Reference 8 respectively), it may have still been reasonable to remain in Strategy W3 during these periods.

31 It appears therefore that the releases under scenarios G1 and G2 would only be permissible under the operational procedures in the Manual if there was a strong expectation that future inflows would be sufficient to increase the dam level back above 68.5 mAHD. Given the low level of the dam, it would be reasonable under such conditions to give strong consideration to targeting flows at Moggill significantly lower than 4,000 m^3/s, to give a safety buffer in case there was a dramatic increase in Lockyer Creek or Bremer River flows.

Yours sincerely,
WMAwater

Mark Babister
Director

Rhys Hardwick Jones
Associate

References

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   Review of Hydraulic Modelling – Queensland Floods Commission of Inquiry
   Queensland Floods Commission of Inquiry, July 2011

2. Queensland Floods Commission of Inquiry
   Modelling of Additional Dam Release Scenarios – Addendum to "Review of Hydraulic Modelling" Report
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   Seqwater, June 2011.

4. SKM
   Joint Calibration of a Hydrologic and Hydrodynamic Model of the Lower Brisbane River, Technical Report, Version 2
   Seqwater, August 2011.

5. WMAwater
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   Queensland Floods Commission of Inquiry, May 2011

6. WMAwater
   Brisbane River 2011 Flood Event – Flood Frequency Analysis
   Queensland Floods Commission of Inquiry, September 2011

7. WMAwater
   Supplementary Report – Ipswich Flood Frequency Analysis
   Queensland Floods Commission of Inquiry, October 2011

8. Seqwater
   Manual of Operational Procedures for Flood Mitigation at Wivenhoe and Somerset Dam – Revision 7
   November 2009

9. Seqwater
   January 2011 Flood Event – Report on the operation of Somerset Dam and Wivenhoe Dam
   March 2011

10. SKM
    Review of Hydrological Issues. January 2011 Flood Event – Report on the operation of Somerset Dam and Wivenhoe Dam
    Seqwater, 11 March 2011

Table 2: Table of hourly variables for Scenario C

Note that some series relating to predicted peak flows do not extend for the full duration of the flood, as predictions relating to forecast rainfall were discontinued near the peak of the second dam inflow.

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
06/01/2011 09:00	67.32	406	50	0	0	0	0	0	172	396	191	396	2	122	346	141	346
06/01/2011 10:00	67.32	177	50	0	0	0	0	0	172	396	191	396	2	122	346	141	346
06/01/2011 11:00	67.33	177	50	0	0	0	0	0	172	396	191	396	2	122	346	141	346
06/01/2011 12:00	67.33	406	50	0	0	0	0	0	425	537	537	685	3	375	487	487	635
06/01/2011 13:00	67.34	177	50	0	0	0	0	0	425	537	537	685	3	375	487	487	635
06/01/2011 14:00	67.35	152	50	0	0	0	0	0	425	537	537	685	3	375	487	487	635
06/01/2011 15:00	67.35	559	50	0	0	0	0	0	425	537	537	685	3	375	487	487	635
06/01/2011 16:00	67.36	534	50	0	0	0	0	0	425	537	537	685	3	375	487	487	635
06/01/2011 17:00	67.38	330	50	0	0	0	0	0	425	537	537	685	3	375	487	487	635
06/01/2011 18:00	67.39	355	50	0	0	0	0	0	1386	1414	1581	1636	4	380	456	652	816
06/01/2011 19:00	67.40	355	50	0	0	0	0	0	1386	1414	1581	1636	4	380	456	652	816
06/01/2011 20:00	67.41	355	50	0	0	0	0	0	1386	1414	1581	1636	4	380	456	652	816
06/01/2011 21:00	67.42	355	50	0	0	0	0	0	1386	1414	1581	1636	4	380	456	652	816
06/01/2011 22:00	67.43	305	50	0	0	0	0	0	1386	1414	1581	1636	4	380	456	652	816
06/01/2011 23:00	67.44	660	50	0	0	0	0	0	1386	1414	1581	1636	4	380	456	652	816

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
07/01/2011 00:00	67.45	1047	50	0	0	0	0	0	1386	1414	1581	1636	4	380	456	652	816
07/01/2011 01:00	67.48	798	50	0	0	0	0	0	1386	1414	1581	1636	4	380	456	652	816
07/01/2011 02:00	67.51	800	50	0	0	0	0	0	1426	1457	1725	1797	5	471	553	715	961
07/01/2011 03:00	67.53	980	50	0	0	0	0	0	1426	1457	1725	1797	5	471	553	715	961
07/01/2011 04:00	67.56	1135	50	0	0	0	0	0	1426	1457	1725	1797	5	471	553	715	961
07/01/2011 05:00	67.59	1342	50	0	0	0	0	0	1426	1457	1725	1797	5	471	553	715	961
07/01/2011 06:00	67.63	1109	50	0	0	0	0	0	1410	1452	1713	1827	6	474	598	688	1058
07/01/2011 07:00	67.67	1134	50	0	0	0	0	0	1410	1452	1713	1827	6	474	598	688	1058
07/01/2011 08:00	67.70	1167	50	0	0	0	0	0	1410	1452	1713	1827	6	474	598	688	1058
07/01/2011 09:00	67.74	864	50	0	0	0	0	0	1510	1552	1832	1959	7	475	566	675	966
07/01/2011 10:00	67.77	1648	50	0	0	0	0	0	1510	1552	1832	1959	7	475	566	675	966
07/01/2011 11:00	67.81	2225	50	0	0	0	0	0	1510	1552	1832	1959	7	475	566	675	966
07/01/2011 12:00	67.87	1778	50	0	0	0	0	0	1510	1552	1832	1959	7	475	566	675	966
07/01/2011 13:00	67.93	1472	50	0	0	0	0	0	1510	1552	1832	1959	7	475	566	675	966
07/01/2011 14:00	67.98	1139	50	0	0	0	0	0	1510	1552	1832	1959	7	475	566	675	966
07/01/2011 15:00	68.02	995	64	0	0	0.5	0	0	1606	1664	1887	2054	8	528	660	709	1037
07/01/2011 16:00	68.05	1020	116	0	0	1	0	0	1606	1664	1887	2054	8	528	660	709	1037
07/01/2011 17:00	68.08	1523	167	0	0	1.5	0	0	1606	1664	1887	2054	8	528	660	709	1037
07/01/2011 18:00	68.11	1360	218	0	0	2	0	0	1606	1664	1887	2054	8	528	660	709	1037

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
07/01/2011 19:00	68.15	958	268	0	0	2.5	0	0	1606	1664	1887	2054	8	528	660	709	1037
07/01/2011 20:00	68.18	1514	316	0	0	3	0	0	1606	1664	1887	2054	8	528	660	709	1037
07/01/2011 21:00	68.21	1300	363	0	0	3.5	0	0	1606	1664	1887	2054	8	528	660	709	1037
07/01/2011 22:00	68.24	1387	416	0	0.5	3.5	0	0	1606	1664	1887	2054	8	528	660	709	1037
07/01/2011 23:00	68.27	1519	468	0	0.5	3.5	0.5	0	1606	1664	1887	2054	8	528	660	709	1037
08/01/2011 00:00	68.30	818	522	0	1	3.5	0.5	0	1606	1664	1887	2054	8	528	660	709	1037
08/01/2011 01:00	68.33	1841	575	0	1	3.5	1	0	1606	1664	1887	2054	8	528	660	709	1037
08/01/2011 02:00	68.35	1624	627	0.5	1	3.5	1	0	1606	1664	1887	2054	8	528	660	709	1037
08/01/2011 03:00	68.38	1246	681	0.5	1	3.5	1	0.5	1606	1664	1887	2054	8	528	660	709	1037
08/01/2011 04:00	68.41	1622	732	0.5	1.5	3.5	1	0.5	1606	1664	1887	2054	8	528	660	709	1037
08/01/2011 05:00	68.43	1135	784	0.5	1.5	3.5	1.5	0.5	1606	1664	1887	2054	8	528	660	709	1037
08/01/2011 06:00	68.45	1867	838	1	1.5	3.5	1.5	0.5	1606	1664	1887	2054	8	528	660	709	1037
08/01/2011 07:00	68.47	2144	892	1	1.5	3.5	1.5	1	1627	1697	1730	1948	9	531	691	531	828
08/01/2011 08:00	68.51	1515	939	1	1.5	4	1.5	1	1627	1697	1730	1948	9	531	691	531	828
08/01/2011 09:00	68.54	1649	991	1	2	4	1.5	1	1627	1697	1730	1948	9	531	691	531	828
08/01/2011 10:00	68.55	1755	1043	1	2	4	2	1	1627	1697	1730	1948	9	531	691	531	828
08/01/2011 11:00	68.58	1399	1097	1.5	2	4	2	1	1627	1697	1730	1948	9	531	691	531	828
08/01/2011 12:00	68.59	1260	1150	1.5	2	4	2	1.5	1627	1697	1730	1948	9	531	691	531	828
08/01/2011 13:00	68.60	1530	1202	1.5	2.5	4	2	1.5	1627	1697	1730	1948	9	531	691	531	828

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
08/01/2011 14:00	68.60	1799	1355	2	2.5	4	2.5	2	1724	1826	1943	2253	10	528	771	528	940
08/01/2011 15:00	68.62	1581	1356	2	2.5	4	2.5	2	1724	1826	1943	2253	10	528	771	528	940
08/01/2011 16:00	68.63	1418	1403	2	2.5	4.5	2.5	2	1748	1843	1943	2312	10	528	771	528	940
08/01/2011 17:00	68.63	1227	1454	2.5	2.5	4.5	2.5	2	1788	1880	1942	2391	10	528	771	528	940
08/01/2011 18:00	68.63	1255	1505	2.5	2.5	4.5	2.5	2.5	1837	1925	1932	2350	11	531	774	531	897
08/01/2011 19:00	68.62	1255	1553	2.5	3	4.5	2.5	2.5	1876	1962	1931	2391	11	531	774	531	897
08/01/2011 20:00	68.61	1255	1602	2.5	3	4.5	3	2.5	1916	1999	1964	2465	11	531	774	531	897
08/01/2011 21:00	68.60	1282	1649	2.5	3.5	4.5	3	2.5	1954	2035	2033	2543	11	531	774	531	897
08/01/2011 22:00	68.59	1091	1696	2.5	3.5	4.5	3.5	2.5	1993	2071	2081	2593	11	531	774	531	897
08/01/2011 23:00	68.57	899	1744	3	3.5	4.5	3.5	2.5	2032	2108	2131	2634	11	531	774	531	897
09/01/2011 00:00	68.55	926	1791	3	3.5	4.5	3.5	3	2072	2146	2183	2681	11	531	774	531	897
09/01/2011 01:00	68.53	925	1789	3	3.5	4.5	3.5	3	2062	2142	2062	2568	12	528	771	528	836
09/01/2011 02:00	68.50	943	1787	3	3.5	4.5	3.5	3	2062	2142	2062	2568	12	528	771	528	836
09/01/2011 03:00	68.47	1189	1784	3	3.5	4.5	3.5	3	2062	2142	2079	2570	12	528	771	528	836
09/01/2011 04:00	68.45	970	1782	3	3.5	4.5	3.5	3	2062	2142	2099	2600	12	528	771	528	836
09/01/2011 05:00	68.43	802	1781	3	3.5	4.5	3.5	3	2062	2142	2100	2602	12	528	771	528	836
09/01/2011 06:00	68.40	1047	1778	3	3.5	4.5	3.5	3	2076	2156	2076	2531	13	531	774	531	795
09/01/2011 07:00	68.38	1046	1776	3	3.5	4.5	3.5	3	2076	2156	2076	2531	13	531	774	531	795
09/01/2011 08:00	68.35	773	1774	3	3.5	4.5	3.5	3	2065	2146	2065	2495	14	528	771	528	780

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
09/01/2011 09:00	68.33	1182	1771	3	3.5	4.5	3.5	3	2098	2195	2098	2365	15	531	799	531	799
09/01/2011 10:00	68.30	1536	1769	3	3.5	4.5	3.5	3	2098	2195	2098	2397	15	531	799	531	799
09/01/2011 11:00	68.29	1646	1768	3	3.5	4.5	3.5	3	2098	2195	2098	2422	15	531	799	531	799
09/01/2011 12:00	68.28	2080	1767	3	3.5	4.5	3.5	3	2088	2264	2225	2743	16	528	795	572	1182
09/01/2011 13:00	68.29	2054	1768	3	3.5	4.5	3.5	3	2088	2264	2225	2743	16	528	795	572	1182
09/01/2011 14:00	68.29	3448	1815	3	4	4.5	3.5	3	2066	2321	2437	2817	17	528	771	689	1207
09/01/2011 15:00	68.32	4136	1907	3	4	5	4	3	2139	2332	2522	2923	18	531	774	692	1207
09/01/2011 16:00	68.38	3946	2008	3.5	4	5	4	3.5	2906	2957	3810	4024	19	531	774	1054	1716
09/01/2011 17:00	68.45	4733	2105	3.5	4.5	5	4.5	3.5	3024	3076	3938	4160	20	531	774	1174	1929
09/01/2011 18:00	68.52	5454	2206	4	4.5	5	4.5	4	3018	3070	3933	4155	20	531	774	1174	1929
09/01/2011 19:00	68.61	5848	2216	4	4.5	5	4.5	4	3191	3243	4115	4356	21	528	771	1253	1941
09/01/2011 20:00	68.71	7338	2319	4.5	4.5	5	4.5	4.5	3053	3125	3986	4354	22	531	774	1254	1964
09/01/2011 21:00	68.85	7659	2423	4.5	5	5	5	4.5	3052	3124	3985	4353	22	531	774	1254	1964
09/01/2011 22:00	69.00	7646	2533	5	5	5	5	5	3050	3158	3984	4351	22	531	774	1254	1964
09/01/2011 23:00	69.16	7935	2552	5	5	5	5	5	3049	3193	3983	4350	22	531	774	1254	1964
10/01/2011 00:00	69.31	7936	2572	5	5	5	5	5	3052	3225	3982	4349	22	531	774	1254	1964
10/01/2011 01:00	69.47	8449	2590	5	5	5	5	5	3152	3348	4061	4427	23	620	821	1294	2002
10/01/2011 02:00	69.63	8732	2607	5	5	5	5	5	3192	3380	4060	4426	23	620	821	1294	2002
10/01/2011 03:00	69.80	9133	2628	5	5	5	5	5	3256	3436	4041	4440	24	622	824	1263	1970

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
10/01/2011 04:00	69.98	8759	2651	5	5	5	5	5	3219	3454	4005	4620	25	620	837	1240	1976
10/01/2011 05:00	70.16	8933	2669	5	5	5	5	5	3261	3488	4003	4617	25	620	837	1240	1976
10/01/2011 06:00	70.33	9312	2690	5	5	5	5	5	3294	3513	4002	4615	25	620	837	1240	1976
10/01/2011 07:00	70.51	9351	2514	4.5	4.5	5	4.5	4.5	3294	3513	4000	4614	25	620	837	1240	1976
10/01/2011 08:00	70.70	10095	2279	4	4	4.5	4	4	3294	3513	4000	4613	25	620	837	1240	1976
10/01/2011 09:00	70.90	9731	2191	3.5	4	4.5	4	3.5	3303	3685	3974	4618	26	630	1090	1221	2092
10/01/2011 10:00	71.11	7267	1993	3	3.5	4.5	3.5	3	3303	3685	3974	4618	26	630	1090	1221	2092
10/01/2011 11:00	71.28	8059	2007	3	3.5	4.5	3.5	3	3303	3685	3974	4618	26	630	1090	1221	2092
10/01/2011 12:00	71.43	9026	2019	3	3.5	4.5	3.5	3	3293	3880	4462	5555	27	630	1455	1615	2861
10/01/2011 13:00	71.60	7384	2031	3	3.5	4.5	3.5	3	3293	3880	4462	5555	27	630	1455	1615	2861
10/01/2011 14:00	71.76	7856	2043	3	3.5	4.5	3.5	3	3293	3880	4462	5555	27	630	1455	1615	2861
10/01/2011 15:00	71.91	8411	2054	3	3.5	4.5	3.5	3	3437	4138	4409	5128	28	779	1497	1594	2566
10/01/2011 16:00	72.08	6568	2121	3	4	4.5	3.5	3	3453	4160	4841	5574	29	785	1501	1999	3008
10/01/2011 17:00	72.23	5116	2244	3	4	5	4	3	3464	4170	3887	4474	30	785	1501	1105	1884
10/01/2011 18:00	72.34	5286	2365	3.5	4	5	4	3.5	3464	4170	3887	4474	30	785	1501	1105	1884
10/01/2011 19:00	72.42	4946	2482	3.5	4.5	5	4.5	3.5	3464	4170	3887	4474	30	785	1501	1105	1884
10/01/2011 20:00	72.50	4920	2657	4.5	4.5	5	4.5	4	3439	4139	3820	4411	31	779	1497	1063	1837
10/01/2011 21:00	72.55	5026	2662	4.5	4.5	5	4.5	4	3439	4139	3820	4411	31	779	1497	1063	1837
10/01/2011 22:00	72.60	4488	2666	4.5	4.5	5	4.5	4	3439	4139	3820	4411	31	779	1497	1063	1837

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
10/01/2011 23:00	72.65	4574	2670	4.5	4.5	5	4.5	4	3439	4139	3820	4411	31	779	1497	1063	1837
11/01/2011 00:00	72.69	4654	2673	4.5	4.5	5	4.5	4	3586	4196	4009	4504	32	892	1554	1265	1918
11/01/2011 01:00	72.74	4175	2677	4.5	4.5	5	4.5	4	3586	4196	4009	4504	32	892	1554	1265	1918
11/01/2011 02:00	72.77	3594	2680	4.5	4.5	5	4.5	4	3616	4196	4010	4567	33	896	1554	1233	1940
11/01/2011 03:00	72.80	4388	2682	4.5	4.5	5	4.5	4	3634	4196	4017	4593	34	905	1554	1231	1942
11/01/2011 04:00	72.83	4974	2685	4.5	4.5	5	4.5	4	3522	4139	3849	4489	35	780	1497	1055	1811
11/01/2011 05:00	72.87	5866	2689	4.5	4.5	5	4.5	4	3522	4139	3849	4489	35	780	1497	1055	1811
11/01/2011 06:00	72.94	6817	2696	4.5	4.5	5	4.5	4	4899	5155	4432	5035	36	1314	1626	1596	2326
11/01/2011 07:00	73.02	6802	2704	4.5	4.5	5	4.5	4	4899	5155	4432	5035	36	1314	1626	1596	2326
11/01/2011 08:00	73.12	8060	2713	4.5	4.5	5	4.5	4	5362	5803	5814	6468	37	1751	2318	2126	3005
11/01/2011 09:00	73.23	9165	2934	4.5	5	5.5	5	4.5	5362	5803	5814	6468	37	1751	2318	2126	3005
11/01/2011 10:00	73.37	10376	3282	5.5	5.5	5.5	5.5	5.5	6796	7596	7788	9202	38	2368	3424	3061	4949
11/01/2011 11:00	73.53	9606	3467	5.5	6	6	6	5.5	6796	7596	7788	9202	38	2368	3424	3061	4949
11/01/2011 12:00	73.69	10120	3596	6	6	6	6	6	6796	7596	7788	9202	38	2368	3424	3061	4949
11/01/2011 13:00	73.84	11561	3615	6	6	6	6	6	8037	9080	8779	10555	39	2996	4406	3563	5768
11/01/2011 14:00	74.01	9739	3917	6.5	6.5	6.5	6.5	6.5	8484	9707	9125	11090	40	3421	4993	3963	6335
11/01/2011 15:00	74.17	9055	3937	6.5	6.5	6.5	6.5	6.5	7359	8584	7990	9960	40	3421	4993	3963	6335
11/01/2011 16:00	74.30	8947	4238	7	7	7	7	7	7640	8791	8274	10242	40	3421	4993	3963	6335
11/01/2011 17:00	74.42	8196	4252	7	7	7	7	7	7640	8791	8274	10242	40	3421	4993	3963	6335

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
11/01/2011 18:00	74.52	7141	4553	7.5	7.5	7.5	7.5	7.5	7920	8923	8560	10526	40	3421	4993	3963	6335
11/01/2011 19:00	74.59	6876	4564	7.5	7.5	7.5	7.5	7.5	8102	9456	8706	10707	41	3542	5534	4020	6914
11/01/2011 20:00	74.65	7060	4863	8	8	8	8	8	8375	9552	8996	10821	41	3542	5534	4020	6914
11/01/2011 21:00	74.70	6797	4872	8	8	8	8	8	10329	11356			42	3542	5535		
11/01/2011 22:00	74.75	6229	5170	8.5	8.5	8.5	8.5	8.5	9313	10211			42	3542	5535		
11/01/2011 23:00	74.78	5964	5176	8.5	8.5	8.5	8.5	8.5	9313	10211			42	3542	5535		
12/01/2011 00:00	74.80	5052	5180	8.5	8.5	8.5	8.5	8.5	9287	10129			42	3542	5535		
12/01/2011 01:00	74.81	4750	5182	8.5	8.5	8.5	8.5	8.5	8661	9516			42	3542	5535		
12/01/2011 02:00	74.80	4096	5180	8.5	8.5	8.5	8.5	8.5	8635	9516			42	3542	5535		
12/01/2011 03:00	74.78	4638	5177	8.5	8.5	8.5	8.5	8.5	8490	9516			42	3542	5535		
12/01/2011 04:00	74.77	4190	4884	8	8	8	8	8	8490	9516			42	3542	5535		
12/01/2011 05:00	74.75	4083	4303	7	7	7	7	7	8490	9516			42	3542	5535		
12/01/2011 06:00	74.74	3984	3723	6	6	6	6	6	8490	9516			42	3542	5535		
12/01/2011 07:00	74.74	3694	3141	5	5	5	5	5	8490	9516			42	3542	5535		
12/01/2011 08:00	74.75	2473	2544	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
12/01/2011 09:00	74.76	2510	2544	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
12/01/2011 10:00	74.76	2804	2544	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
12/01/2011 11:00	74.76	2730	2544	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
12/01/2011 12:00	74.76	3025	2545	3.5	4	5	4	3.5	8490	9516			43	3542	5535		

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
12/01/2011 13:00	74.77	3098	2545	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
12/01/2011 14:00	74.78	2145	2546	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
12/01/2011 15:00	74.78	2880	2546	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
12/01/2011 16:00	74.78	2511	2546	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
12/01/2011 17:00	74.79	2476	2546	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
12/01/2011 18:00	74.79	3136	2546	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
12/01/2011 19:00	74.79	2513	2546	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
12/01/2011 20:00	74.80	2329	2547	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
12/01/2011 21:00	74.79	2072	2547	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
12/01/2011 22:00	74.79	2108	2546	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
12/01/2011 23:00	74.78	2107	2545	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
13/01/2011 00:00	74.77	2143	2545	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
13/01/2011 01:00	74.76	1848	2544	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
13/01/2011 02:00	74.74	1887	2543	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
13/01/2011 03:00	74.73	1891	2542	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
13/01/2011 04:00	74.71	1890	2541	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
13/01/2011 05:00	74.70	1888	2540	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
13/01/2011 06:00	74.68	1887	2539	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
13/01/2011 07:00	74.67	1922	2539	3.5	4	5	4	3.5	8490	9516			43	3542	5535		

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
13/01/2011 08:00	74.66	1631	2538	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
13/01/2011 09:00	74.64	1629	2536	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
13/01/2011 10:00	74.62	1918	2535	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
13/01/2011 11:00	74.60	1917	2534	3.5	4	5	4	3.5	8490	9516			43	3542	5535		
13/01/2011 12:00	74.59	1589	2533	3.5	4	5	4	3.5	8490	9516			44	3542	5535		
13/01/2011 13:00	74.57	1938	2591	3.5	4.5	5	4	3.5	8490	9516			44	3542	5535		
13/01/2011 14:00	74.55	2359	2649	3.5	4.5	5	4.5	3.5	8490	9516			44	3542	5535		
13/01/2011 15:00	74.54	1451	2649	4	4.5	5	4	3.5					44	3542	5535		
13/01/2011 16:00	74.52	1677	2767	4	4.5	5	4.5	4					44	3542	5535		
13/01/2011 17:00	74.50	1817	2824	4.5	4.5	5	4.5	4					44	3542	5535		
13/01/2011 18:00	74.47	1231	2881	4.5	4.5	5	4.5	4.5					44	3542	5535		
13/01/2011 19:00	74.44	2062	2996	4.5	5	5	5	4.5					44	3542	5535		
13/01/2011 20:00	74.41	1530	3111	5	5	5	5	5					44	3542	5535		
13/01/2011 21:00	74.38	1679	3222	5	5.5	5.5	5	5					44	3542	5535		
13/01/2011 22:00	74.34	2091	3275	5	5.5	5.5	5.5	5					44	3542	5535		
13/01/2011 23:00	74.31	1534	3329	5.5	5.5	5.5	5.5	5					44	3542	5535		
14/01/2011 00:00	74.28	1667	3383	5.5	5.5	5.5	5.5	5.5					44	3542	5535		
14/01/2011 01:00	74.24	1767	3436	5.5	5.5	6	5.5	5.5					44	3542	5535		
14/01/2011 02:00	74.20	1572	3489	5.5	6	6	5.5	5.5					44	3542	5535		

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
14/01/2011 03:00	74.16	1339	3541	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 04:00	74.11	1653	3535	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 05:00	74.06	1648	3530	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 06:00	74.02	1338	3525	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 07:00	73.97	1659	3519	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 08:00	73.92	1616	3513	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 09:00	73.87	1612	3507	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 10:00	73.83	1640	3502	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 11:00	73.79	1399	3496	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 12:00	73.74	1163	3491	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 13:00	73.69	1193	3485	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 14:00	73.63	1151	3479	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 15:00	73.58	1386	3472	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 16:00	73.52	1705	3466	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 17:00	73.48	1090	3460	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 18:00	73.43	1392	3454	5.5	6	6	6	5.5					44	3542	5535		
14/01/2011 19:00	73.37	1715	3502	6	6	6	6	5.5					44	3542	5535		
14/01/2011 20:00	73.33	1399	3496	6	6	6	6	5.5					44	3542	5535		
14/01/2011 21:00	73.28	1441	3491	6	6	6	6	5.5					44	3542	5535		

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
14/01/2011 22:00	73.23	1482	3485	6	6	6	6	5.5					44	3542	5535		
14/01/2011 23:00	73.18	1202	3479	6	6	6	6	5.5					44	3542	5535		
15/01/2011 00:00	73.13	1229	3472	6	6	6	6	5.5					44	3542	5535		
15/01/2011 01:00	73.07	1259	3465	6	6	6	6	5.5					44	3542	5535		
15/01/2011 02:00	73.02	997	3458	6	6	6	6	5.5					44	3542	5535		
15/01/2011 03:00	72.97	1087	3506	6	6	6	6	6					44	3542	5535		
15/01/2011 04:00	72.91	1078	3499	6	6	6	6	6					44	3542	5535		
15/01/2011 05:00	72.86	1071	3492	6	6	6	6	6					44	3542	5535		
15/01/2011 06:00	72.80	1079	3485	6	6	6	6	6					44	3542	5535		
15/01/2011 07:00	72.75	1085	3479	6	6	6	6	6					44	3542	5535		
15/01/2011 08:00	72.70	1075	3472	6	6	6	6	6					44	3542	5535		
15/01/2011 09:00	72.64	1066	3465	6	6	6	6	6					44	3542	5535		
15/01/2011 10:00	72.59	1094	3513	6	6	6.5	6	6					44	3542	5535		
15/01/2011 11:00	72.54	1365	3505	6	6	6.5	6	6					44	3542	5535		
15/01/2011 12:00	72.48	1355	3498	6	6	6.5	6	6					44	3542	5535		
15/01/2011 13:00	72.42	1084	3490	6	6	6.5	6	6					44	3542	5535		
15/01/2011 14:00	72.35	1151	3481	6	6	6.5	6	6					44	3542	5535		
15/01/2011 15:00	72.29	899	3472	6	6	6.5	6	6					44	3542	5535		
15/01/2011 16:00	72.21	862	3463	6	6	6.5	6	6					44	3542	5535		

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
15/01/2011 17:00	72.14	1487	3503	6	6.5	6.5	6	6					44	3542	5535		
15/01/2011 18:00	72.07	971	3494	6	6.5	6.5	6	6					44	3542	5535		
15/01/2011 19:00	72.01	527	3485	6	6.5	6.5	6	6					44	3542	5535		
15/01/2011 20:00	71.93	491	3475	6	6.5	6.5	6	6					44	3542	5535		
15/01/2011 21:00	71.86	1154	3465	6	6.5	6.5	6	6					44	3542	5535		
15/01/2011 22:00	71.79	1943	3506	6	6.5	6.5	6.5	6					44	3542	5535		
15/01/2011 23:00	71.74	1406	3499	6	6.5	6.5	6.5	6					44	3542	5535		
16/01/2011 00:00	71.69	956	3492	6	6.5	6.5	6.5	6					44	3542	5535		
16/01/2011 01:00	71.63	1009	3484	6	6.5	6.5	6.5	6					44	3542	5535		
16/01/2011 02:00	71.56	1043	3475	6	6.5	6.5	6.5	6					44	3542	5535		
16/01/2011 03:00	71.50	767	3466	6	6.5	6.5	6.5	6					44	3542	5535		
16/01/2011 04:00	71.43	1093	3505	6.5	6.5	6.5	6.5	6					44	3542	5535		
16/01/2011 05:00	71.36	1080	3496	6.5	6.5	6.5	6.5	6					44	3542	5535		
16/01/2011 06:00	71.30	838	3488	6.5	6.5	6.5	6.5	6					44	3542	5535		
16/01/2011 07:00	71.23	908	3479	6.5	6.5	6.5	6.5	6					44	3542	5535		
16/01/2011 08:00	71.16	677	3469	6.5	6.5	6.5	6.5	6					44	3542	5535		
16/01/2011 09:00	71.09	510	3508	6.5	6.5	6.5	6.5	6.5					44	3542	5535		
16/01/2011 10:00	71.01	488	3496	6.5	6.5	6.5	6.5	6.5					44	3542	5535		
16/01/2011 11:00	70.93	911	3484	6.5	6.5	6.5	6.5	6.5					44	3542	5535		

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
16/01/2011 12:00	70.85	1355	3473	6.5	6.5	6.5	6.5	6.5					44	3542	5535		
16/01/2011 13:00	70.79	1106	3511	6.5	6.5	7	6.5	6.5					44	3542	5535		
16/01/2011 14:00	70.73	1173	3501	6.5	6.5	7	6.5	6.5					44	3542	5535		
16/01/2011 15:00	70.66	1007	3491	6.5	6.5	7	6.5	6.5					44	3542	5535		
16/01/2011 16:00	70.60	360	3528	6.5	7	7	6.5	6.5					44	3542	5535		
16/01/2011 17:00	70.52	428	3515	6.5	7	7	6.5	6.5					44	3542	5535		
16/01/2011 18:00	70.43	602	3499	6.5	7	7	6.5	6.5					44	3542	5535		
16/01/2011 19:00	70.35	1010	3486	6.5	7	7	6.5	6.5					44	3542	5535		
16/01/2011 20:00	70.27	1301	3522	6.5	7	7	7	6.5					44	3542	5535		
16/01/2011 21:00	70.20	827	3512	6.5	7	7	7	6.5					44	3542	5535		
16/01/2011 22:00	70.14	634	3500	6.5	7	7	7	6.5					44	3542	5535		
16/01/2011 23:00	70.06	624	3442	6.5	7	7	7	6					44	3542	5535		
17/01/2011 00:00	69.98	632	3428	6.5	7	7	7	6					44	3542	5535		
17/01/2011 01:00	69.90	700	3415	6.5	7	7	7	6					44	3542	5535		
17/01/2011 02:00	69.82	0	3402	6.5	7	7	7	6					44	3542	5535		
17/01/2011 03:00	69.73	253	3388	6.5	7	7	7	6					44	3542	5535		
17/01/2011 04:00	69.64	724	3373	6.5	7	7	7	6					44	3542	5535		
17/01/2011 05:00	69.56	160	3359	6.5	7	7	7	6					44	3542	5535		
17/01/2011 06:00	69.47	734	3345	6.5	7	7	7	6					44	3542	5535		

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
17/01/2011 07:00	69.38	239	3331	6.5	7	7	7	6					44	3542	5535		
17/01/2011 08:00	69.30	0	3317	6.5	7	7	7	6					44	3542	5535		
17/01/2011 09:00	69.21	751	3301	6.5	7	7	7	6					44	3542	5535		
17/01/2011 10:00	69.12	293	3286	6.5	7	7	7	6					44	3542	5535		
17/01/2011 11:00	69.04	0	3272	6.5	7	7	7	6					44	3542	5535		
17/01/2011 12:00	68.94	268	3257	6.5	7	7	7	6					44	3542	5535		
17/01/2011 13:00	68.85	759	3241	6.5	7	7	7	6					44	3542	5535		
17/01/2011 14:00	68.76	1309	3144	6.5	6.5	6.5	6.5	6.5					44	3542	5535		
17/01/2011 15:00	68.70	806	3047	6	6.5	6.5	6.5	6					44	3542	5535		
17/01/2011 16:00	68.64	0	2953	6	6	6.5	6	6					44	3542	5535		
17/01/2011 17:00	68.56	919	2899	6	6	6	6	6					44	3542	5535		
17/01/2011 18:00	68.48	574	2672	5.5	5.5	5.5	5.5	5.5					44	3542	5535		
17/01/2011 19:00	68.42	424	2577	5	5.5	5.5	5.5	5					44	3542	5535		
17/01/2011 20:00	68.35	786	2482	5	5	5.5	5	5					44	3542	5535		
17/01/2011 21:00	68.29	545	2388	5	5	5	5	4.5					44	3542	5535		
17/01/2011 22:00	68.24	0	2295	4.5	5	5	4.5	4.5					44	3542	5535		
17/01/2011 23:00	68.17	0	2200	4.5	4.5	5	4.5	4					44	3542	5535		
18/01/2011 00:00	68.10	981	2101	4	4.5	5	4.5	3.5					44	3542	5535		
18/01/2011 01:00	68.05	828	2096	4	4.5	5	4.5	3.5					44	3542	5535		

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
18/01/2011 02:00	68.02	834	2092	4	4.5	5	4.5	3.5					44	3542	5535		
18/01/2011 03:00	67.98	881	2087	4	4.5	5	4.5	3.5					44	3542	5535		
18/01/2011 04:00	67.94	510	2083	4	4.5	5	4.5	3.5					44	3542	5535		
18/01/2011 05:00	67.89	136	2079	4	4.5	5	4.5	3.5					44	3542	5535		
18/01/2011 06:00	67.83	195	2073	4	4.5	5	4.5	3.5					44	3542	5535		
18/01/2011 07:00	67.77	126	2066	4	4.5	5	4.5	3.5					44	3542	5535		
18/01/2011 08:00	67.71	715	2059	4	4.5	5	4.5	3.5					44	3542	5535		
18/01/2011 09:00	67.66	775	1966	3.5	4.5	5	4	3.5					44	3542	5535		
18/01/2011 10:00	67.62	425	1873	3.5	4	5	4	3					44	3542	5535		
18/01/2011 11:00	67.58	570	1781	3	4	4.5	4	3					44	3542	5535		
18/01/2011 12:00	67.53	488	1689	3	3.5	4.5	3.5	3					44	3542	5535		
18/01/2011 13:00	67.49	243	1593	2.5	3.5	4.5	3.5	2.5					44	3542	5535		
18/01/2011 14:00	67.45	0	1498	2.5	3	4.5	3	2.5					44	3542	5535		
18/01/2011 15:00	67.41	247	1495	2.5	3	4.5	3	2.5					44	3542	5535		
18/01/2011 16:00	67.36	1032	1491	2.5	3	4.5	3	2.5					44	3542	5535		
18/01/2011 17:00	67.33	570	1489	2.5	3	4.5	3	2.5					44	3542	5535		
18/01/2011 18:00	67.31	223	1488	2.5	3	4.5	3	2.5					44	3542	5535		
18/01/2011 19:00	67.27	231	1485	2.5	3	4.5	3	2.5					44	3542	5535		
18/01/2011 20:00	67.23	603	1482	2.5	3	4.5	3	2.5					44	3542	5535		

Date and Time	Wivenhoe Lake Level (mAHD)	Assumed Dam Inflow (m^3/s)	"Scenario C" Dam Outlofw (m^3/s)	Gate Settings (m)					Predicted Total Peak Flows INCLUDING Wivenhoe Releases (m^3/s)				Seqwater Operational Spreadsheet "Run No"	Predicted Total Peak Flows EXCLUDING Wivenhoe Releases (m^3/s)			
				1	2	3	4	5	Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)		Lowood (without forecast rain)	Moggill (without forecast rain)	Lowood (with forecast rain)	Moggill (with forecast rain)
18/01/2011 21:00	67.20	755	1435	2.5	3	4.5	2.5	2.5					44	3542	5535		
18/01/2011 22:00	67.17	235	1341	2.5	2.5	4.5	2.5	2					44	3542	5535		
18/01/2011 23:00	67.14	188	1244	2	2.5	4.5	2.5	1.5					44	3542	5535		
19/01/2011 00:00	67.11	46	1152	1.5	2.5	4	2.5	1.5					44	3542	5535		
19/01/2011 01:00	67.07	302	1056	1.5	2	4	2	1.5					44	3542	5535		
19/01/2011 02:00	67.04	609	958	1	2	4	2	1					44	3542	5535		
19/01/2011 03:00	67.02	96	861	1	1.5	4	1.5	1					44	3542	5535		
19/01/2011 04:00	67.01	0	762	0.5	1.5	4	1.5	0.5					44	3542	5535		
19/01/2011 05:00	66.98	244	665	0.5	1	4	1	0.5					44	3542	5535		
19/01/2011 06:00	66.96	466	567	0	1	4	1	0					44	3542	5535		
19/01/2011 07:00	66.95	319	469	0	0.5	4	0.5	0					44	3542	5535		
19/01/2011 08:00	66.95	228	377	0	0.5	3.5	0	0					44	3542	5535		
19/01/2011 09:00	66.94	136	284	0	0	3	0	0					44	3542	5535		