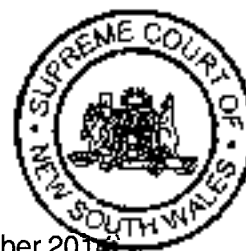


FILED

20 FEB 2015



**AMENDED STATEMENT OF CLAIM**

(Filed pursuant to an order made by Garling J on 7 November 2014)

**COURT DETAILS**

Court Supreme Court of New South Wales  
Division Common Law  
Registry Sydney  
Case number

2014 / 200834

**TITLE OF PROCEEDINGS**

Plaintiff **Rodriguez & Sons Pty Ltd (ACN 108 770 681)**  
First defendant **Queensland Bulk Water Supply Authority trading as Seqwater**  
Number of defendants **3**

**FILING DETAILS**

Filed for Rodriguez & Sons Pty Ltd, the plaintiff  
Legal representative Damian Scattini, Maurice Blackburn Pty Ltd  
Legal representative reference DVS/3043899  
Contact name and telephone Damian Scattini (07) 3016 0300  
Contact email [DScattini@mauriceblackburn.com.au](mailto:DScattini@mauriceblackburn.com.au)

**TYPE OF CLAIM**

Tort - Negligence - Nuisance

**RELIEF CLAIMED**

- 1 Damages.
- 2 Interest in accordance with s 100 of the *Civil Procedure Act 2005* (NSW).
- 3 Costs.

TABLE OF CONTENTS

**A The Plaintiff.....6**

**B The Defendants.....6**

**C January 2011 Queensland Flood.....7**

**D Group Members and Common Questions.....7**

**E Somerset Dam.....13**

**F Wivenhoe Dam.....16**

**G Flood Mitigation.....20**

**H Seqwater's Ownership and Control of Somerset Dam and Wivenhoe Dam.....23**

**I SunWater's Control of Somerset Dam and Wivenhoe Dam.....26**

**J The Flood Mitigation Manual.....29**

    Status, Purpose and Objectives of the Flood Mitigation Manual.....29

    Flood Operations Personnel and Responsibilities.....31

    Definition of "Flood Event".....35

    Wivenhoe Dam Flood Operations Strategies.....35

    Somerset Dam Flood Operations Strategies.....41

**K The Real Time Flood Model.....44**

**L Duties of Care.....47**

Risk of Harm.....47

    Seqwater's Duty of Care as Owner and Occupier.....48

    Seqwater's Direct Duty of Care as Sole Licensee under the Water Act.....55

    SunWater's Direct Duty of Care.....56

    Flood Engineers' Duty of Care.....63

**M Events of 1 December to 16 December 2010 ~~December 2010~~-Flood Operations.....69**

Rainfall and Inflows.....69

Water Level.....69

Flood Operations.....70

16 December Breaches.....	73
<b>N Events of <del>16</del> 17 December to 24 December 2010.....</b>	<b>77</b>
<u>Weather Forecasts</u> .....	77
<u>Rainfall and Inflows</u> .....	81
<u>Water Level</u> .....	81
<u>Flood Operations</u> .....	82
<u>17-24 December Breaches</u> .....	86
<b>O Events of 24 25 December 2010 to 1 January 2011.....</b>	<b>91</b>
<u>Weather Forecasts</u> .....	91
Rainfall and Inflows.....	95
<u>Water Level</u> .....	96
<u>Flood Operations</u> .....	97
<u>25 December - 1 January Breaches</u> .....	101
<b>P Events of 2 January 2011.....</b>	<b>102</b>
Weather Forecasts.....	102
Rainfall and Inflows.....	104
Water Level.....	105
Flood Operations.....	106
2 January 2011 Breaches.....	107
<b>Q Events of 3 January to 5 January 2011.....</b>	<b>112</b>
Weather Forecasts.....	112
Rainfall and Inflows.....	114
Water Level.....	115
Flood Operations.....	117
3-5 January 2011 Breaches.....	117
<b>R Events of 6 January 2011.....</b>	<b>123</b>
Weather Forecasts.....	123
Rainfall and Inflows.....	124
Water Level.....	125

Flood Operations.....	126
6 January 2011 Breaches.....	127
<b>S Events of 7 January 2011.....</b>	<b>132</b>
Weather Forecasts.....	132
Rainfall and Inflows.....	133
Water Level.....	134
Flood Operations.....	135
7 January 2011 Breaches.....	137
<b>T Events of 8 January 2011.....</b>	<b>142</b>
Weather Forecasts.....	142
Rainfall and Inflows.....	144
Water Level.....	144
Flood Operations.....	146
8 January 2011 Breaches.....	147
<b>U Events of 9 January 2011.....</b>	<b>153</b>
Weather Forecasts.....	153
Rainfall and Inflows.....	154
Water Level.....	154
Flood Operations.....	156
9 January 2011 Breaches.....	158
<b>V Events of 10 January to 11 January 2011.....</b>	<b>164</b>
Weather Forecasts.....	164
Rainfall and Inflows.....	166
Water Level.....	167
Flood Operations.....	169
10-11 January 2011 Breaches.....	172
<b>W Causation and Loss.....</b>	<b>177</b>
<b>X Direct Liability of Seqwater and SunWater in Negligence.....</b>	<b>181</b>
Direct Liability of Seqwater in Negligence.....	181

Liability of SunWater in Negligence.....	182
<b>Y Private Nuisance and Trespass.....</b>	<b>182</b>
<b>Z Vicarious Liability.....</b>	<b>185</b>
Vicarious Liability of Seqwater.....	185
Vicarious Liability of SunWater.....	186
Vicarious Liability of the State of Queensland.....	187
<b>AA Section 374 of the Water Supply Act.....</b>	<b>188</b>
<b>BB Relief.....</b>	<b>189</b>

**A The Plaintiff**

- 1 At all material times, the plaintiff, Rodriguez & Sons Pty Ltd (ACN 108 770 681):
- a) was a duly incorporated company according to law and capable of suing;
  - b) conducted or sought to conduct the business of operating a retail sports goods and clothing shop; and
  - c) held a lease over a shopfront in a shopping centre located at 180 Fairfield Road, Fairfield, shop 9 on lot 5 on plan RP 212124, Parish of Yeerongpilly, County of Stanley in the State of Queensland, from which it conducted or sought to conduct that business.

**B The Defendants**

- 2 At all material times, the first defendant, the Queensland Bulk Water Supply Authority trading as Seqwater (**Seqwater**):
- a) was an entity established under s 6 of the *South East Queensland Water (Restructuring) Act 2007* (Qld) (the **Restructuring Act**);
  - b) was not a body corporate;
  - c) did not represent the State of Queensland; and
  - d) was capable of being sued.
- 3 At all material times, the second defendant, SunWater Limited (ACN 131 034 985) (**SunWater**):
- a) was a government owned corporation within the meaning of s 5 of the *Government Owned Corporations Act 1993* (Qld);
  - b) was a registered public company limited by shares;
  - c) did not represent the State of Queensland; and
  - d) was capable of being sued.

- 4 At all material times, the third defendant, the State of Queensland was capable of being sued in accordance with s 8 of the *Crown Proceedings Act 1980* (Qld).

**C January 2011 Queensland Flood**

- 5 In January 2011, the Brisbane River and Bremer River (and their tributaries) flooded causing substantial inundation to areas located downstream of Wivenhoe Dam in the period 9 January 2011 ~~to~~ and 24 January 2011.

**PARTICULARS**

- A. The areas located downstream of Wivenhoe Dam that were substantially inundated in the period 9 January 2011 to 24 January 2011 are indicated by the January 2011 Interim Flood Line Map created by Department of Environment and Resource Management with input from Brisbane City Council (on file with the Plaintiff's solicitors).

**D Group Members and Common Questions**

- 6 The Group Members for purposes of this proceeding are, subject to paragraph 7 below, all persons who:
- a) held an interest in land (whether in the nature of freehold title, lease or otherwise) and:
- i) who suffered loss or damage (whenever occurring) by reason of the inundation of that land by flood water from the Brisbane River or Bremer River (and their tributaries) in the period 9 January 2011 to 24 January 2011; and, or alternatively,
- ii) whose use or enjoyment of that interest was interfered with by reason of the inundation of that land, or of other land located downstream of Wivenhoe Dam, by flood water from the Brisbane River or Bremer River (and their tributaries) in the period 9 January 2011 to 24 January 2011 such that they suffered loss or damage; or

- b) owned personal property in the period 9 January 2011 to 24 January 2011 which was damaged or destroyed by reason of the inundation of land on which that property was located by flood water from the Brisbane River or Bremer River (and their tributaries) in the period 9 January 2011 to 24 January 2011; or
- c) regularly conducted a business or enterprise, in whole or in part, at one or more locations located downstream of Wivenhoe Dam and who suffered economic loss by reason of the inundation by flood water from the Brisbane River or Bremer River (and their tributaries) of areas located downstream of Wivenhoe Dam in the period 9 January 2011 to 24 January 2011;

AND

- d) either:
  - i) entered into a litigation funding agreement with Bentham IMF Limited ABN 45 067 298 088 (now known as IMF Bentham Limited):
    - (1) as at the date of the commencement of this proceeding;  
or
    - (2) after the commencement of this proceeding, but on or before the date of the filing this Amended Statement of Claim:  
  
in respect of any claim for loss or damage (excluding any claim for personal injury) arising out of the factual matters pleaded in this Amended Statement of Claim; or
  - ii) have been indemnified by an insurer in respect any loss or damage (excluding any claim for personal injury) that those persons have suffered arising out of the factual matters pleaded in this Amended Statement of Claim, where that insurer has entered into a litigation funding agreement with Bentham IMF Limited ABN 45 067 298 088:
    - (1) as at the date of the commencement of this proceeding;



(2) as at the date of the commencement of this proceeding;  
or

(3) after the commencement of this proceeding, but on or before the date of the filing this Amended Statement of Claim:

- in respect of that loss or damage.

7 The following persons are not Group Members for purposes of this proceeding:

- a) the Commonwealth, or any agency or instrumentality thereof;
- b) the States or Territories, or any agency or instrumentality thereof;
- c) a Minister of the Commonwealth, a State or Territories; or
- d) any judicial officer of the Commonwealth, a State or Territories.

8 The claims advanced by the plaintiff, on its own behalf, and on behalf of Group Members, in this proceeding:

- a) are limited to claims for damage to real property, damage to personal property, economic loss, and interference with the use or enjoyment of interests in land resulting in loss (including economic loss) or damage; and
- b) do not include any claims for loss or damage for, or arising out of, any personal injury.

9 As of the date of the commencement of this proceeding, there are seven or more persons who are Group Members having claims against each defendant as pleaded in this Amended Statement of Claim.

10 The questions of law or fact common to the claims of the Group Members in this proceeding are:

- a) whether, at all material times, Seqwater had authority to operate Somerset Dam and Wivenhoe Dam, including for flood mitigation;

- b) whether Seqwater was authorised or permitted to delegate its rights, powers and obligations to operate Somerset Dam and Wivenhoe Dam under the Seqwater ROL (as defined in paragraph 62 below) to any other person;
- c) whether, at all material times, SunWater had practical control of Somerset Dam and Wivenhoe Dam for conducting Flood Operations (as defined in paragraph 55 below);
- d) whether Seqwater, SunWater and, or alternatively, their employees and agents were required to adhere to the terms of the Flood Mitigation Manual (as defined in paragraph A of the particulars to paragraph 22 below) in conducting Flood Operations at Somerset Dam and Wivenhoe Dam;
- e) whether Seqwater owed the plaintiff and other Group Members the duty of care pleaded in paragraph 144 below;
- f) whether Seqwater owed the plaintiff and other Group Members the duty of care pleaded at paragraphs 145 to 146 below;
- g) whether SunWater owed the plaintiff and other Group Members the duty of care pleaded in paragraph 148 below;
- h) whether each of the Flood Engineers (as defined in paragraph 101 below) owed the plaintiff and other Group Members the duty of care pleaded in paragraph 150;
- i) whether the omissions by the Flood Engineers (or one or more of them) pleaded in paragraphs 212, 229, 246, 268, 289, and 308 occurred;
- j) whether the 16 December Breaches (as defined in paragraph 162 below) occurred;
- k) whether the 17-24 December Breaches (as defined in paragraph 178 below) occurred;
- l) whether 25 December – 1 January Breaches (as defined in paragraph 191C below) occurred:

- m) whether the 2 January Breaches (as defined in paragraph 213 below) occurred;
- n) whether the 3-5 January Breaches (as defined in paragraph 230 below) occurred;
- o) whether the 6 January Breaches (as defined in paragraph 247 below) occurred;
- p) whether the 7 January Breaches (as defined in paragraph 269 below) occurred;
- q) whether the 8 January Breaches (as defined in paragraph 290 below) occurred;
- r) whether the 9 January Breaches (as defined in paragraph 309 below) occurred;
- s) whether the 10-11 January Breaches (as defined in paragraph 341 below) occurred;
- t) whether, if one or more of the Flood Engineers' Breaches (as defined in paragraph 343 below) occurred, those breaches caused there to be insufficient available capacity in Lake Somerset and Lake Wivenhoe in the period from the evening of 9 January 2011 to 11 January 2011 to store incoming inflows, or otherwise to mitigate effectively the effect of such inflows;
- u) whether, if one or more of the Flood Engineers' Breaches occurred, those breaches caused greater inundation of land downstream of Wivenhoe Dam by flood water than would have otherwise occurred;
- v) the extent to which one or more of the Flood Engineers' Breaches caused greater inundation of land downstream of Wivenhoe Dam by flood water than would have otherwise occurred;
- w) whether the Flood Engineers' Breaches caused greater loss or damage downstream to the plaintiff and Group Members than would have otherwise occurred;

- x) whether, if one or more of the Flood Engineers' Breaches occurred, Seqwater breached Seqwater's Duty of Care as Owner and Occupier (as defined in paragraph 144 below) or Seqwater's Duty as Licensee (as defined in paragraph 145 below);
- y) whether, if one or more of the Flood Engineers' Breaches occurred, SunWater breached SunWater's Duty of Care (as defined in paragraph 148 below);
- z) whether, at all material times in December 2010 and January 2011, the Risk of Interference with Use and Enjoyment (as defined in paragraph 142A below) was reasonably foreseeable by Seqwater or, alternatively, the Flood Engineers; ~~that the making of releases of water from Wivenhoe Dam at volumes significantly in excess of those that would have been necessary had Flood Operations been properly conducted would unreasonably interfere with the use or enjoyment of interests in land located downstream of Wivenhoe Dam, including interests in such land held by Subgroup Members (as defined in paragraph 354 below);~~
- aa) whether the release of water from Wivenhoe Dam in the period 9 January 2011 to 19 January 2011 substantially and unreasonably interfered with the use and enjoyment of the interests in land held by Subgroup Members (as defined in paragraph 354 below); ~~of Subgroup Members' interests in land;~~
- bb) whether the release of water from Wivenhoe Dam onto land in which Subgroup Members held an interest in the period 9 January 2011 to 19 January 2011, or onto other land located downstream of Wivenhoe Dam, constituted a private nuisance by Seqwater, SunWater and, or alternatively, the Flood Engineers (or one or more of them);
- cc) whether the release of water from Wivenhoe Dam onto land in which Subgroup Members held an interest in the period 9 January 2011 to 19 January 2011, or onto other land located downstream of Wivenhoe Dam, constituted a trespass by Seqwater, SunWater and, or alternatively, the Flood Engineers (or one or more of them);

- dd) whether, if one or more of Flood Engineers' Breaches occurred, Seqwater, SunWater and, or alternatively, the State of Queensland, are vicariously liable for those breaches;
- ee) whether, if the Flood Engineers or one or more of them committed a private nuisance or trespass as alleged in paragraphs 359 and 362, Seqwater, SunWater and, or alternatively, the State of Queensland, are vicariously liable for that nuisance or trespass; and
- ff) whether, and to what extent, the State of Queensland is liable for the conduct of Seqwater, SunWater and, or alternatively, the Flood Engineers, by operation of s 374 of the *Water Supply (Safety and Reliability Act 2008* (Qld) (**Water Supply Act**) (as it then stood).

## **E Somerset Dam**

- 11 The Stanley River in Queensland is dammed by Somerset Dam, a concrete gravity dam situated partly on lot 35 on plan CG2149, Parish of Bowman, County of Canning, in the Region of Somerset.
- 12 Somerset Dam forms Lake Somerset upstream of the dam. In this pleading, "**Lake Somerset**" is used to refer to the reservoir or ponded area of Somerset Dam.
- 13 Water released from Somerset Dam flows south along the Stanley River until it merges with the Brisbane River north of Lake Wivenhoe.
- 14 Somerset Dam is designed for both water supply and flood mitigation purposes.
- 15 Somerset Dam was also designed for hydroelectric power generation and the infrastructure at Somerset Dam includes a hydroelectric power station (however, at all material times, the hydroelectric power station at Somerset Dam was not in operation).
- 16 Of the total capacity of Lake Somerset, a portion is dedicated to water supply (the **drinking water storage compartment**) and a portion is

dedicated to flood mitigation (the **flood storage compartment**). There is no discrete storage dedicated to hydropower.

- 17 At all material times, water could be released from Somerset Dam by means of 8 radial gates, 8 sluice gates and 4 cone dispersion type regulator valves.
- 18 The radial gates, sluice gates and regulator valves can be operated in a variety of ways to alter the volume of water discharged from Somerset Dam at any given time.
- 19 The characteristics and capabilities of Somerset Dam enable the dam operator to engage in active flood mitigation by controlling the amount of outflow from the dam.
- 20 At all material times, the Full Supply Level of Somerset Dam was elevation level (EL) 99.0 metres Australian Height Datum (**AHD**). In this pleading, the "**Full Supply Level**" of a dam is the level of the water surface in the ponded area of a dam when the drinking water storage compartment is full and not affected by flood.

#### **PARTICULARS**

- A. Water Supply Act, Schedule 3.
  - B. *Water Act 2000* (Qld) (the **Water Act**), Schedule 4.
  - C. At all material times, the Full Supply Level of Somerset Dam was set by s 72 and Attachment 5 of the *Moreton Resource Operations Plan*, December 2009 (the **Moreton ROP**).
- 21 At all material times, the Full Supply Volume of Somerset Dam was 379,850 megalitres. In this pleading, "**Full Supply Volume**" refers to the volume of water within the ponded area of a dam which corresponds to the Full Supply Level.

#### **PARTICULARS**

- A. At all material times, the Full Supply Volume of Somerset Dam was set by s 72 and Attachment 5 of the Moreton ROP.

- 22 At all material times, the capacity of the flood storage compartment of Lake Somerset was approximately 524,000 megalitres.

**PARTICULARS**

- A. Seqwater, *Manual of Operational Procedures for Flood Mitigation at Wivenhoe Dam and Somerset Dam*, November 2009, Appendix D (the **Flood Mitigation Manual**).
- B. The flood storage compartment is the reservoir capacity that, in effect, sits above the drinking water storage compartment. The base of the flood storage compartment is the dam's Full Supply Level.

- 23 At all material times, the elevation of the spillway crest of Somerset Dam was EL 100.45 m AHD.

**PARTICULARS**

- A. Flood Mitigation Manual, Appendix I.

- 24 At all material times, the elevation of the top of the closed radial gates at Somerset Dam was approximately EL 107.46 m AHD.

**PARTICULARS**

- A. Flood Mitigation Manual, Appendix I.

- 25 At all material times, the elevation of the top of the deck of Somerset Dam was approximately EL 112.34 m AHD.

**PARTICULARS**

- A. Flood Mitigation Manual, Appendix I.

- 26 Somerset Dam is designed to withstand limited overtopping over the top of the radial gates (but not over the top deck of the dam).

- 27 At all material times, Somerset Dam had a predicted failure level of EL 109.7 m AHD, being the elevation at which it was predicted that water in Lake Somerset would cause the dam to breach and result in an uncontrolled and catastrophic release of water downstream.

## PARTICULARS

A. Flood Mitigation Manual, section 9.3.

### F Wivenhoe Dam

- 28 The Brisbane River in Queensland is dammed by Wivenhoe Dam, being a zoned earth fill and rock fill saddle dam at Wivenhoe, locality of Fernvale, situated partly on lot 242 on plan SL12236, Parish of Wivenhoe, County of Cavendish, in the Region of Somerset.
- 29 Wivenhoe Dam forms Lake Wivenhoe immediately upstream of the dam. In this pleading, "**Lake Wivenhoe**" is used to refer to the reservoir or ponded area of Wivenhoe Dam.
- 30 Water flowing into Lake Wivenhoe and through Wivenhoe Dam includes water released through Somerset Dam into the Stanley River immediately upstream of Lake Wivenhoe. When Lake Wivenhoe is at or above Full Supply Level, water in Lake Wivenhoe abuts the face of Somerset Dam.
- 31 In addition to water flowing into Lake Wivenhoe from the Stanley River, Lake Wivenhoe is fed by the Brisbane River and other smaller watercourses adjacent to Lake Wivenhoe.
- 32 Water is also released into Lake Wivenhoe from Splityard Creek Dam, which is an earth and rock fill dam located on the eastern side of Lake Wivenhoe.
- 33 At all material times, Splityard Creek Dam was owned and operated by Tarong Energy Corporation (**Tarong Energy**).
- 34 Splityard Creek Dam is designed for hydroelectric power generation and primarily operates by pumping water from Lake Wivenhoe to a reservoir upstream of Splityard Creek Dam and generating electricity by releasing that water back into Lake Wivenhoe.



- 35 In addition to water deliberately pumped from Lake Wivenhoe, water flows into the reservoir upstream of Splityard Creek Dam from a catchment area of approximately 3.6 km<sup>2</sup>.
- 36 The reservoir upstream of Splityard Creek Dam has a capacity of approximately 28,700 megalitres, and Splityard Creek Dam is capable of releasing water from into Lake Wivenhoe at a rate of up to 420 m<sup>3</sup>/s.
- 37 Water released from Lake Wivenhoe through Wivenhoe Dam flows into the Brisbane River, which then passes near the towns of Lowood and Fernvale, and the suburb of Moggill (among others), before passing through the urban areas of Ipswich and Brisbane and into Moreton Bay.
- 38 Lockyer Creek meets the Brisbane River downstream of Wivenhoe Dam and upstream of Lowood.
- 39 The Bremer River meets the Brisbane River downstream of the intersection between the Lockyer Creek and the Brisbane River, near Moggill.
- 40 Other smaller watercourses also enter the Brisbane River below Wivenhoe Dam.
- 41 Generally, and during times of flood, the extent of flooding in the urban areas downstream of Wivenhoe Dam (including Brisbane and Ipswich) will be a function of the amount of water:
- a) released from Wivenhoe Dam (which itself will be a function of, among other things, the amount of water flowing into Lake Wivenhoe through Somerset Dam, through Splityard Creek Dam, from the Brisbane River and other watercourses upstream of Wivenhoe Dam, and as a result of rainfall over Lake Wivenhoe);
  - b) the inflows into the Brisbane River from Lockyer Creek, the Bremer River and smaller tributaries downstream of Wivenhoe Dam;
  - c) rainfall over the Brisbane River catchment areas downstream of Wivenhoe Dam; and

- d) catchment runoff into the Brisbane River downstream of Wivenhoe Dam.
- 42 Flood travel time from Wivenhoe Dam to Brisbane City is approximately 30 hours, but may be less as a result of faster moving flows (including flows caused by large volume releases from Wivenhoe Dam).

#### **PARTICULARS**

- A. Bureau of Meteorology, Report to Queensland Floods Commission of Inquiry, March 2011, [240].
- 43 Wivenhoe Dam is designed for both water supply and flood mitigation purposes, and Lake Wivenhoe is divided into a drinking water storage compartment and a flood storage compartment.
- 44 Wivenhoe Dam was also designed for hydroelectric power generation and the infrastructure at Wivenhoe Dam includes a hydroelectric power station.
- 45 Water-can At all material times, water could be released from Wivenhoe Dam by means of:
- a) a primary spillway with 5 radial gates and two regulator valves (one of which is connected to the hydroelectric power station at Wivenhoe Dam) (the **Primary Spillway**); and
  - b) an auxiliary spillway fitted with 3 erodible fuse plugs (the **Auxiliary Spillway**).

#### **PARTICULARS**

- A. Flood Mitigation Manual, section 8.2.
- 46 The Primary Spillway and the Auxiliary Spillway are concrete facilities embedded within a portion of the earthen embankment of Wivenhoe Dam.
- 47 The radial gates and regulator valves on the Primary Spillway at Wivenhoe Dam can be operated in a variety of ways to alter the volume of water discharged from Wivenhoe Dam at any given time.

- 48 The characteristics and capabilities of the Primary Spillway at Wivenhoe Dam enable the dam operator to engage in active flood mitigation by controlling the amount of outflow from the Primary Spillway, subject to the dam operator's preparedness to do so.
- 49 Wivenhoe Dam is not designed to be overtopped, and overtopping at Wivenhoe Dam would carry with it a risk of rapid erosion of the earthen embankment of the dam, dam breach and failure, with a consequent catastrophic uncontrolled release from Lake Wivenhoe.
- 50 The erodible fuse plugs in the Auxiliary Spillway are designed so that, before Wivenhoe Dam overtops, the fuse plugs will erode, which would result in uncontrolled releases from Lake Wivenhoe (albeit of smaller volume than if Wivenhoe Dam breached and failed).
- 51 Other than by preventing Wivenhoe Dam from overtopping, the Auxiliary Spillway cannot be used for flood mitigation.
- 52 At all material times:
- a) the Full Supply Level of Wivenhoe Dam was EL 67.0 m AHD; and
  - b) the Full Supply Volume of Wivenhoe Dam was 1,165,200 megalitres.

### **PARTICULARS**

- A. At all material times, the Full Supply Level of Wivenhoe Dam was set by s 72 and Attachment 5 of the Moreton ROP.
- 53 At all material times:
- a) the flood storage compartment of Lake Wivenhoe had a capacity of approximately 1,420,000 megalitres;
  - b) the elevation of the base of the radial gates on the Primary Spillway of Wivenhoe Dam was approximately EL 57.0 m AHD (being the minimum water height at which water may be released through the radial gates);

- c) the elevation of the top of the closed radial gates of Wivenhoe Dam was approximately EL 73.0 m AHD;
- d) the elevation of the top of Wivenhoe Dam was approximately EL 79.1 m AHD;
- e) the respective elevations of the three erodible fuse plugs at the Auxiliary Spillway were EL 75.7 m AHD, EL 76.2 m AHD, and EL 76.7 m AHD; and
- f) the predicted dam failure level of Wivenhoe Dam was EL 80.0 m AHD, being the elevation at which it was predicted that water in Lake Wivenhoe would cause the dam to breach and result in an uncontrolled and catastrophic release of water downstream.

#### **PARTICULARS**

- A. Flood Mitigation Manual, sections 8.2, Appendix C and Appendix H.
- B. Seqwater, "Fact Sheet: Somerset and Wivenhoe Dams", previously available at <http://www.previous.seqwater.com.au/public/sites/default/files/userfiles/file/pdfs/Factsheet-SomersetandWivenhoeDams.pdf> (on file with the plaintiff's solicitors).
- C. The flood storage compartment is the reservoir capacity that, in effect, sits above the drinking water storage compartment. The base of the flood storage compartment is the dam's Full Supply Level.

#### **G Flood Mitigation**

- 54 The two principal tools available to the operators of Somerset Dam and Wivenhoe Dam to achieve flood mitigation are:
- a) water storage; and
  - b) water release.

- 55 Somerset Dam and Wivenhoe Dam can be operated to mitigate flooding downstream of Wivenhoe Dam:
- a) by storing flows' inflows upstream of Wivenhoe Dam (in Lake Somerset, Lake Wivenhoe or both) to reduce the rate of outflow from Wivenhoe Dam;
  - b) by releasing water from Wivenhoe Dam at rates of outflow that are less than the rate of inflow into Lake Wivenhoe;
  - c) by releasing water from Somerset Dam to preserve flood storage capacity in Lake Somerset in case of further rainfall and inflows;
  - d) by releasing water from Wivenhoe Dam to preserve flood storage capacity in Lake Wivenhoe in case of further rainfall and inflows;
  - e) by releasing water from Wivenhoe Dam at rates of outflow that would avoid or minimise flooding downstream of Wivenhoe Dam, taking into account:
    - i) past, current and forecast rainfall over the catchment areas of the Brisbane River and its tributaries downstream of Wivenhoe Dam (and the actual and predicted inflows resulting from such rainfall);
    - ii) current and forecast inflows into the Brisbane River downstream of Wivenhoe Dam; and
    - iii) the current and predicted rate of flow of the Brisbane River and its tributaries downstream of Wivenhoe Dam; and
  - f) by a combination of some or all of the activities in (a) to (e).

In this pleading, the deliberate operation of Somerset Dam and Wivenhoe Dam for purposes of flood mitigation by means of one or more of these methods is referred to as "**Flood Operations**".

- 56 Somerset Dam can be safely operated for flood mitigation up to a water level in Lake Somerset of EL 107.46 m AHD. Once the water level in Lake Somerset exceeds that level, there is a substantial risk of dam failure and releases become essential to protect the dam from breach and failure.

- 57 Wivenhoe Dam can be safely operated for flood mitigation up to a water level in Lake Wivenhoe of EL 74.0 m AHD. Once the water level in Lake Wivenhoe exceeds that level, there is a substantial risk of dam failure and releases become essential to protect the dam from breach and failure.
- 58 By reason of the matters pleaded in paragraphs 56 and 57 respectively, it may be necessary in periods of heavy and prolonged rainfall to make precautionary releases from Somerset Dam and Wivenhoe Dam to preserve sufficient capacity in the dams' flood storage compartments to safely store further inflows.
- 59 Flood Operations at Somerset Dam and Wivenhoe Dam require that the dam operators determine, and act in accordance with, release strategies taking into account, among other things:
- a) the water levels in Lake Somerset and Lake Wivenhoe;
  - b) the available capacity in the flood storage compartments of each dam;
  - c) current and forecast inflows into Lake Somerset and Lake Wivenhoe (including the forecast effect of further inflows from past rainfall and the potential for further inflows from future rainfall);
  - d) current and forecast inflows into the Brisbane River downstream of Wivenhoe Dam (including the forecast effect of further inflows from past rainfall and the potential for further inflows from future rainfall);
  - e) current and forecast rainfall directly over Lake Somerset or Lake Wivenhoe;
  - f) the sufficiency of the water in Lake Somerset and Lake Wivenhoe to meet the water supply needs of Brisbane and surrounding areas; and
  - g) the circumstance that large volume releases of water from Wivenhoe Dam in a short period may cause greater downstream flooding, and hence greater downstream damage to property, than would be caused if sustained and more moderate releases of water were made over the course of Flood Operations.

## **PARTICULARS**

- A. The requirement to take into account the factors pleaded in subparagraphs 59(a)-(g) arises by reason of:
1. the features and characteristics of Somerset Dam pleaded in paragraphs 11 to 27:
  2. the features and characteristics of Wivenhoe Dam pleaded in paragraphs 28 to 53; and
  3. the available means by which Somerset Dam and Wivenhoe Dam can be operated to mitigate flooding pleaded in paragraphs 54 to 58 and 60; and
  4. the requirements of the Flood Mitigation Manual pleaded in paragraphs 86 to 89 and 102-104.
- B. The release strategies referred to are the strategies outlined in the Flood Mitigation Manual according to which the flood engineers responsible for Flood Operations at Somerset Dam and Wivenhoe Dam are to determine the manner, method, timing and volume of water releases from each of Somerset Dam and Wivenhoe Dam.

60 The flood mitigation capabilities of Somerset Dam and Wivenhoe Dam are maximised by operating the two dams in conjunction during Flood Operations.

### **H Seqwater's Ownership and Control of Somerset Dam and Wivenhoe Dam**

61 At all material times, Seqwater owned:

- a) Somerset Dam; and
- b) Wivenhoe Dam.

## **PARTICULARS**

- A. Somerset Dam and Wivenhoe Dam were transferred to Seqwater from the South East Queensland Water Corporation Limited with

effect from 1 July 2008 by transfer notice issued by Andrew Fraser, Treasurer, under s 67(1) of the Restructuring Act, signed 20 June 2008 and gazetted 26 June 2008.

- 62 At all material times, Seqwater held a resource operations license (the **Seqwater ROL**) granted under s 107 of the Water Act to operate both Somerset Dam and Wivenhoe Dam.

#### **PARTICULARS**

- A. The Seqwater ROL was signed by RB (Tom) Crothers, General Manager, Water Allocation and Planning, Department of Environment and Resource Management (**DERM**), and was granted on 7 December 2009. The Seqwater ROL was expressed to take effect from that date.
- 63 By operation of s 107A of the Water Act, the effect of the Seqwater ROL was to permit Seqwater to interfere with the flow of water in the Brisbane River and Stanley River, including by operating Somerset Dam and Wivenhoe Dam, where such interference would otherwise be an offence under s 808 of the Water Act.
- 64 On the proper construction of s 107A of the Water Act, Seqwater was not authorised or permitted to delegate its rights, powers and obligations under the Seqwater ROL to any other person.
- 65 By operation of s 110 of the Water Act, and the terms of the Seqwater ROL, it was a condition of the Seqwater ROL that Seqwater comply with the operating arrangements and supply requirements detailed in Chapter 5 of the Moreton ROP (as defined in paragraph C of the particulars to paragraph 20).

#### **PARTICULARS**

- A. The Moreton ROP was made and approved under Part 4 of the Water Act to implement the *Water Resource (Moreton) Plan 2007*. The *Water Resource (Moreton) Plan 2007* is subordinate legislation made under ss 38 and 50 of the Water Act. The Moreton ROP commenced on 7 December 2009.



- 66 At all material times, ss 72(3) and 75 of the Moreton ROP required that Seqwater not release water from Somerset Dam or Wivenhoe Dam, unless the release was necessary:
- a) to meet a specified minimum flow rate of 8.64 ML/day from Mount Crosby Weir (other than during times when critical water sharing arrangements were in force); or
  - b) to supply downstream demand.
- 67 Section 74 of the Moreton ROP further required that Seqwater minimise the occurrence of adverse environmental impacts by ensuring that any change in the release of water from, inter alia, Somerset Dam and Wivenhoe Dam occur incrementally.
- 68 Section 13 of the Moreton ROP permitted Seqwater to seek an interim program from the Chief Executive of DERM in circumstances where it was unable to comply with the terms of the Seqwater ROL and the Moreton ROP.
- 69 Where the Chief Executive of DERM approved an interim program under s 13 of the Moreton ROP, the approved program prevailed over the terms of the Moreton ROP to the extent of any conflict.

## **PARTICULARS**

- A. Moreton ROP, s 13(10).
- 70 On or around 4 February 2010, Seqwater submitted a Statement of Current Programs to the Chief Executive of DERM for approval under s 13(7) of the Moreton ROP (the **February 2010 Interim Program**).
- 71 The February 2010 Interim Program:
- a) recorded that Seqwater was not complying with the restrictions on the release of water from Somerset Dam and Wivenhoe Dam imposed by s 72(3) of the Moreton ROP; and
  - b) proposed that Seqwater would continue to release water from Somerset Dam and Wivenhoe Dam for flood mitigation purposes.

- 72 On or around 12 March 2010, the delegate of the Chief Executive of DERM approved the February 2010 Interim Program under s 13(7) of the Moreton ROP.
- 73 On or around 27 August 2010, Seqwater sought approval from the Chief Executive of DERM for an updated interim program under s 13(7) of the Moreton ROP (the **December August 2010 Interim Program**).
- 74 The ~~December~~ August 2010 Interim Program:
- a) recorded that Seqwater was not complying with the restrictions on the release of water from Somerset Dam and Wivenhoe Dam imposed by s 72(3) of the Moreton ROP; and
  - b) proposed that Seqwater would continue to release water from Somerset Dam and Wivenhoe Dam for flood mitigation purposes.
- 75 On or around 3 December 2010, the delegate of the Chief Executive of DERM approved the ~~Doombor~~ August 2010 Interim Program under s 13(7) of the Moreton ROP.

#### **PARTICULARS**

- A. Letter from Gary Burgess, Acting General Manager, Water Allocation and Planning, DERM, to Alex Fisher, Executive General Manager, Asset Delivery, Seqwater, 3 December 2010.

- 76 By reason of the matters alleged in paragraphs 61 to 75, at all material times, Seqwater had authority to operate Somerset Dam and Wivenhoe Dam for flood mitigation purposes, including by making such releases of water as were necessary to achieve flood mitigation.

#### **I SunWater's Control of Somerset Dam and Wivenhoe Dam**

- 77 On or around 13 October 2009, Seqwater entered into an agreement with SunWater styled "Service Level Agreement - Flood Management Services" (the **Flood Management Services Agreement**).

## PARTICULARS

- A. The Flood Management Services Agreement was executed on 13 October 2009 on behalf of Seqwater by its Chief Executive Officer, Peter Borrows, and on behalf of SunWater by its Chief Executive, Peter Boettcher.
- 78 By clauses 3.1 and 3.2 and the Service Schedule ~~of~~ to the Flood Management Services Agreement, SunWater agreed to provide, inter alia, the following services to Seqwater:
- a) conducting Flood Operations for the Somerset Dam and Wivenhoe Dam in accordance with applicable emergency action plans **(EAPs)**, standing operating procedures **(SOPs)**, and the Flood Mitigation Manual;
  - b) preparing competently to deal with flood events in accordance with applicable EAPs, SOPs, and the Flood Mitigation Manual;
  - c) establishing and maintaining a dedicated Flood Control Centre from which Flood Operations at Somerset Dam and Wivenhoe Dam could be conducted;
  - d) reviewing SOPs and the Flood Mitigation Manual annually to recommend any necessary changes to Seqwater;
  - e) ensuring that SunWater staff, and subcontractors performing services under the Flood Management Services Agreement, were adequately trained;
  - f) recommending any necessary maintenance on the Flood Control Centre and Flood Alert Network to Seqwater each year, and performing approved maintenance as agreed from time to time;
  - g) testing Seqwater's data collection systems to ensure a timely response once a flood event commenced; and
  - h) reporting on flood events within two weeks of the end of each flood event.

## PARTICULARS

- A. Flood Management Services Agreement, Service Schedule, clauses 1, 2, 3, 6.
- 79 By operation of clause 15.11 of the Flood Management Services Agreement, that agreement did not create a partnership, joint venture or agency relationship between Seqwater and SunWater.
- 80 By clause 2.1 of the Flood Management Services Agreement, that agreement was to terminate on 30 June 2010 (unless terminated earlier in accordance with its terms).
- 81 On or around 29 July 2010, Seqwater and SunWater executed a written extension to the Flood Management Services Agreement, which extended the operation of that agreement from 30 June 2010 to 31 July 2010 (the **Deed of Variation and Extension No 1**).

## PARTICULARS

- A. The Deed of Variation and Extension No 1 was executed on or around 29 July 2010 by Peter Borrows on behalf of Seqwater and by Peter Boettcher on behalf of Sunwater.
- 82 On or around 30 September 2010, Seqwater and SunWater executed a further written extension to the Flood Management Services Agreement, which extended the operation of that agreement from 31 July 2010 to 31 October 2010 (the **Deed of Variation and Extension No 2**).

## PARTICULARS

- A. The Deed of Variation and Extension No 2 was executed on or around 30 September 2010 by Jim Pruss on behalf of Seqwater and by Peter Boettcher on behalf of SunWater.
- 83 On or around 24 December 2010, Seqwater and SunWater executed a further written extension to the Flood Management Services Agreement, which extended that agreement from 31 October 2010 to 28 February 2011 (the **Deed of Variation and Extension No 3**).

## PARTICULARS

- A. The Deed of Variation and Extension No 3 was executed on or around 24 December 2010 by Jim Pruss on behalf of Seqwater and by Geoff White on behalf of SunWater.
- 84 By reason of the arrangements pleaded at paragraphs 77 to 83, at all material times, SunWater:
- a) provided flood management services to Seqwater in respect of Somerset Dam and Wivenhoe Dam in accordance with the terms of the Flood Management Services Agreement;
  - b) was purportedly authorised by Seqwater to conduct and control Flood Operations at Somerset Dam and Wivenhoe Dam under the Flood Management Services Agreement (as variously amended by the Deed of Variation and Extension No 1, ~~and the Deed of Variation and Extension~~ No 2, and the Deed of Variation and Extension No 3); and
  - c) had control, as a practical matter, of Somerset Dam and Wivenhoe Dam for purposes of conducting Flood Operations.

## **J The Flood Mitigation Manual**

### ***Status, Purpose and Objectives of the Flood Mitigation Manual***

- 85 In or around November 2009, Seqwater prepared the Flood Mitigation Manual, which prescribed the operational procedures for flood mitigation at Somerset Dam and Wivenhoe Dam.
- 86 Seqwater, SunWater and the flood engineers engaged by them to operate Somerset Dam and Wivenhoe Dam were required to adhere to the terms of the Flood Mitigation Manual in conducting Flood Operations at Somerset Dam and Wivenhoe Dam:
- a) in accordance with sections 1.7 and 2.1 of the Flood Mitigation Manual; and
  - b) in the case of SunWater, in accordance with the terms of the Flood Management Services Agreement.

## **PARTICULARS**

- A. Flood Mitigation Manual, sections 1.7 and 2.1.
- B. Flood Management Services Agreement, clauses 3.1, 3.2 and Service Schedule, clause 1.

87 The purpose of the Flood Mitigation Manual was to define procedures for Flood Operations at Somerset Dam and Wivenhoe Dam to reduce, so far as practicable, the effects of flooding associated with the dams, including by minimising the potential impact on the life and property of downstream populations.

## **PARTICULARS**

- A. Flood Mitigation Manual, sections 1.1, 1.3.

88 The primary objectives of the Flood Mitigation Manual, in descending order of importance, were:

- a) to ensure the structural safety of the dams;
- b) to provide optimum protection of urbanised areas from inundation;
- c) to minimise disruption to rural life in the valleys of the Brisbane and Stanley Rivers;
- d) to retain storage at Full Supply Level at the conclusion of the Flood Event (as defined in paragraph 102 below); and
- e) to minimise impacts to riparian flora and fauna during the drain down phase of the Flood Event.

## **PARTICULARS**

- A. Flood Mitigation Manual, sections 1.1, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 8.4.

89 The Flood Mitigation Manual required that, in meeting these objectives, Somerset Dam and Wivenhoe Dam be operated to account for the potential effects of:

- a) closely spaced storms or Flood Events; and

- b) storms lasting 48 hours or more.

**PARTICULARS**

- A. Flood Mitigation Manual, sections 3.1, 3.2.
- B. Flood Mitigation Manual, Appendix G.

***Flood Operations Personnel and Responsibilities***

- 90 The Flood Mitigation Manual required that Seqwater nominate one or more suitably qualified persons to undertake the role of Senior Flood Operations Engineer, under whose general direction the procedures of the Flood Mitigation Manual were to be carried out.

**PARTICULARS**

- A. Flood Mitigation Manual, sections 1.2, 2.3.
- 91 At all material times in December 2010 and January 2011:
- a) two individuals were authorised to perform the function of Senior Flood Operations Engineer in accordance with the Flood Mitigation Manual:
    - i) Robert Ayre; and
    - ii) John Ruffini; and
  - b) Mr Ayre, in fact, performed the role of Senior Flood Operations Engineer.

**PARTICULARS**

- A. Seqwater, *Flood Operations Preparedness Report: Wivenhoe, Somerset and North Pine Dam*, October 2010, p 10.
- B. Statement of Robert Arnold Ayre to the Queensland Flood Commission of Inquiry, 23 March 2011, [36].

92 At all material times in December 2010 and January 2011:

- a) Mr Ayre was employed by SunWater in the position of Headworks Design Manager, Infrastructure Development Group and Senior Flood Engineer; and
- a) Mr Ruffini was employed by DERM in the position of Director, Water Planning Sciences Branch, Environment and Resource Science Division, Operations and Environmental Regulator Business Group.

**PARTICULARS**

- A. Statement of Robert Arnold Ayre to the Queensland Flood Commission of Inquiry, 23 March 2011, [39], [42].
- B. Statement of John Lawrence Ruffini to the Queensland Floods Commission of Inquiry, 24 March 2011, [17].

93 Mr Ruffini's services were provided by DERM to SunWater for a fee under informal arrangements between DERM and SunWater.

**PARTICULARS**

- A. Statement of John Lawrence Ruffini to the Queensland Floods Commission of Inquiry, 24 March 2011, [21]-[24].
- B. Further particulars may be provided after discovery.

94 When rostered on duty, the functions of the Senior Flood Operations Engineer were:

- a) to be in charge of Flood Operations at all times during a "Flood Event" (as defined in the Flood Mitigation Manual);
- b) to set the overall strategy for management of the Flood Event in accordance with the objectives in the Flood Mitigation Manual;
- c) to provide instructions to staff at Somerset Dam and Wivenhoe Dam to make releases of water during Flood Events in accordance with the Flood Mitigation Manual; and



- d) to apply reasonable discretion in managing Flood Events, but only after making a reasonable attempt to consult both the Chairperson of Seqwater and the Chief Executive of DERM.

**PARTICULARS**

- A. Flood Mitigation Manual, sections 2.2, 2.3, 2.8.

- 95 The Flood Mitigation Manual required that Seqwater nominate one or more suitably qualified and experienced persons to undertake the role of Flood Operations Engineer.

**PARTICULARS**

- A. Flood Mitigation Manual, sections 1.2, 2.4.

- 96 At all material times, two individuals were authorised to perform the function of Flood Operations Engineer in accordance with the Flood Mitigation Manual:

- a) Terry Malone; and
- b) John Tibaldi.

**PARTICULARS**

- A. *Seqwater, Flood Operations Preparedness Report: Wivenhoe, Somerset and North Pine Dam, October 2010, p 10.*

- 97 At all material times:

- a) Mr Malone was employed by Seqwater in the position of Principal Hydrologist, Water Delivery; and
- b) Mr Tibaldi was employed by Seqwater in the position of Principal Engineer, Dam Safety.

- 98 When rostered on duty, the functions of a Flood Operations Engineer were:

- a) to direct the operation of Somerset Dam and Wivenhoe Dam during a Flood Event in accordance with the general strategy determined by the Senior Flood Operations Engineer;

- b) to follow the Flood Mitigation Manual in managing Flood Events, except where directed by the Senior Flood Operations Engineer to use reasonable discretion; and
- c) to provide instructions to staff at Somerset Dam and Wivenhoe Dam to make releases of water during a Flood Event in accordance with the Flood Mitigation Manual.

**PARTICULARS**

- A. Flood Mitigation Manual, section 2.4.

99 The Flood Mitigation Manual required that a Senior Flood Operations Engineer or a Flood Operations Engineer be rostered on call at all times to be in charge of Flood Operations at Somerset Dam and Wivenhoe Dam (the **Duty Flood Operations Engineer**).

**PARTICULARS**

- A. Flood Mitigation Manual, section 2.2.

100 The Flood Mitigation Manual required that the Duty Flood Operations Engineer:

- a) constantly review weather forecasts and catchment rainfall;
- b) declare a Flood Event if the water level of either Wivenhoe Dam or Somerset Dam was expected to exceed Full Supply Level as a result of prevailing or predicted weather conditions; and
- c) direct the release of water from Somerset Dam and Wivenhoe Dam during a Flood Event in accordance with the Flood Mitigation Manual.

**PARTICULARS**

- A. Flood Mitigation Manual, section 2.2.

101 In the period December 2010 to January 2011, four individuals acted as Duty Flood Operations Engineer at various times:

- a) Mr Ayre;
- b) Mr Ruffini;

- c) Mr Malone; and
- d) Mr Tibaldi (collectively, the **Flood Engineers**).

***Definition of "Flood Event"***

102 Under the terms of the Flood Mitigation Manual, a "**Flood Event**" was defined to mean a situation where the Duty Flood Operations Engineer expects the water level in Lake Somerset to exceed the Full Supply Level of Somerset Dam, or the water level in Lake Wivenhoe to exceed the Full Supply Level of Wivenhoe Dam.

**PARTICULARS**

A. Flood Mitigation Manual, section 1.2.

103 In the case of Wivenhoe Dam, the definition of "Flood Event" in the Flood Mitigation Manual meant that a Flood Event commenced ~~when~~ once the Duty Flood Operations Engineer expected the water level of Lake Wivenhoe to exceed EL 67.0 m AHD.

104 In the case of Somerset Dam, the definition of "Flood Event" in the Flood Mitigation Manual meant that a Flood Event commenced once the Duty Flood Operations Engineer expected the water level of Lake Somerset to exceed EL 99.0 m AHD.

***Wivenhoe Dam Flood Operations Strategies***

105 The Flood Mitigation Manual specified four Flood Operations strategies for Wivenhoe Dam during a Flood Event:

- a) Strategy W1;
- b) Strategy W2;
- c) Strategy W3; and
- d) Strategy W4.

106 The Flood Mitigation Manual required the Flood Engineers to select the appropriate strategy taking into account:

- a) the objectives of the Flood Mitigation Manual pleaded in paragraph 88, and their relative importance;
- b) the actual water levels of Lake Somerset and Lake Wivenhoe; and
- c) the following predictions (which were to be made using the best forecast rainfall and stream flow information available at the time):
  - i) the maximum storage levels in Lake Somerset and Lake Wivenhoe;
  - ii) the peak flow rate at the Lowood Gauge (excluding Wivenhoe Dam releases); and
  - iii) the peak flow rate at the Moggill Gauge (excluding Wivenhoe Dam releases).

#### **PARTICULARS**

- A. Flood Mitigation Manual, section 8.4.

106A In making predictions as to expected storage levels in Lake Somerset and Lake Wivenhoe, the Flood Engineers were required to consider the following rainfall scenarios:

- a) actual rainfall:
- b) actual rainfall plus 100% of forecast rainfall;
- c) actual rainfall plus 50% of forecast rainfall: and
- d) actual rainfall plus 200% of forecast rainfall.

#### **PARTICULARS**

- A. Seqwater. Flood Procedures Manual: Wivenhoe Dam, Somerset Dam, North Pine Dam, Leslie Harrison Dam, Uncontrolled Spillway Dams. January 2010 (the **Flood Procedures Manual**), section 3.2.

106B The Flood Engineers were required to consider rainfall hydrographs reflecting each of rainfall scenarios pleaded in the preceding paragraph in evaluating alternative release strategies from Somerset Dam and

Wivenhoe Dam in accordance with the strategies in the Flood Mitigation Manual.

**PARTICULARS**

A. Flood Procedures Manual, section 3.2.

107 Further, the Flood Mitigation Manual required the Flood Engineers to change strategies as necessary in response to rainfall, changing rainfall forecasts and stream flow conditions, and in order to maximise the flood mitigation benefits of the dams.

**PARTICULARS**

A. Flood Mitigation Manual, section 8.4.

108 The Flood Mitigation Manual required the Flood Engineers to select release strategies at Wivenhoe Dam taking into account the operation of Splityard Creek Dam.

**PARTICULARS**

A. Flood Mitigation Manual, sections 8.1.

109 The Flood Mitigation Manual required the Flood Engineers to select Strategy W1 at Wivenhoe Dam where:

- a) the water level of Lake Wivenhoe exceeded EL 67.25 m AHD; and
- b) was predicted to be less than EL 68.5 m AHD.

**PARTICULARS**

A. Flood Mitigation Manual, section 8.4.

110 Under Strategy W1:

- a) the primary consideration specified by the Flood Mitigation Manual was to minimise disruption to downstream rural life, including by ensuring that downstream rural bridges were not submerged;
- b) the Flood Engineers were required to control releases from Wivenhoe Dam to ensure that the combined flow from Wivenhoe Dam and

Lockyer Creek was less than the limiting values specified for Strategy W1 in the Flood Mitigation Manual; and

- c) the Flood Engineers were required to ensure that maximum releases, taking into account the combined flow from Wivenhoe Dam and Lockyer Creek, did not exceed 1,900 m<sup>3</sup>/s.

#### **PARTICULARS**

- A. Flood Mitigation Manual, section 8.4.

111 The Flood Mitigation Manual required the Flood Engineers to select Strategy W2 where:

- a) the water level of Lake Wivenhoe was predicted to be more than EL 68.5 m AHD, but less than EL 74.0 m AHD;
- b) the maximum peak at Lowood (located downstream of Wivenhoe Dam) was predicted to be less than 3,500 m<sup>3</sup>/s; and
- c) the maximum peak at Moggill (located downstream of both Wivenhoe Dam and Lowood) was predicted to be less than 4,000 m<sup>3</sup>/s.

#### **PARTICULARS**

- A. Flood Mitigation Manual, section 8.4.

112 Strategy W2 was described in the Flood Mitigation Manual as a "transition strategy", where the primary consideration changes from minimising disruption to downstream rural life under Strategy W1, to protecting urban areas from inundation.

#### **PARTICULARS**

- A. Flood Mitigation Manual, section 8.4.

113 Under Strategy W2:

- a) the Flood Engineers were required to control releases taking into account the combined flow of the releases from Wivenhoe Dam, Lockyer Creek and the Bremer River (the **Combined Peak Flow**);

- b) the Flood Engineers were required to control releases from Wivenhoe Dam so as to ensure:
  - i) that the Combined Peak Flow at Lowood was the lesser of the natural peak flow (excluding Wivenhoe Dam releases) and 3,500 m<sup>3</sup>/s; and
  - ii) that the Combined Peak Flow at Moggill was the lesser of the natural peak flow (excluding Wivenhoe Dam releases) and 4,000 m<sup>3</sup>/s.

#### **PARTICULARS**

- A. Flood Mitigation Manual, section 8.4.
- B. *Seqwater, Operation of Wivenhoe Dam and Somerset Dam January 2011 Flood Event: Explanation of Operational Methods and Decision-Making Practices*, July 2011, [3.4.2].

114 The Flood Mitigation Manual required the Flood Engineers to select Strategy W3 where:

- a) the maximum water level of Lake Wivenhoe was predicted to be more than EL 68.5 m AHD, but less than EL 74.0 m AHD; and
- b) Strategy W2 could not be met.

#### **PARTICULARS**

- A. Flood Mitigation Manual, section 8.4.

115 Under Strategy W3:

- a) the primary consideration specified in the Flood Mitigation Manual was the protection of urban areas from inundation; and
- b) the Flood Engineers were required to control releases to ensure that the maximum combined flow of the Brisbane River at Moggill (taking into account flows from Lockyer Creek and the Bremer River) was 4,000 m<sup>3</sup>/s, or was minimised in circumstances where it was not possible to limit the combined flow to 4,000 m<sup>3</sup>/s.

### **PARTICULARS**

A. Flood Mitigation Manual, section 8.4.

116 The Flood Mitigation Manual required the Flood Engineers to select Strategy W4 where the maximum water level of Lake Wivenhoe was predicted to exceed EL 74.0 m AHD.

### **PARTICULARS**

A. Flood Mitigation Manual, section 8.4.

117 Under Strategy W4:

- a) the primary consideration specified in the Flood Mitigation Manual was the protection of the structural safety of the dam; and
- b) there was no limit on the maximum release rate.

### **PARTICULARS**

A. Flood Mitigation Manual, section 8.4.

118 The Flood Mitigation Manual required that, once a Flood Event and water releases commenced, Flood Operations and water releases were to continue at Wivenhoe Dam:

- a) until Lake Wivenhoe returned to Full Supply Level (except in cases where Lake Wivenhoe was below EL 67.5 m AHD and a favourable weather outlook existed); or
- b) until the level of Lake Wivenhoe was reduced below Full Supply Level where such reduction was necessary to ensure that remaining inflows would not result in Lake Wivenhoe exceeding Full Supply Level at the end of the Flood Event.

### **PARTICULARS**

A. Flood Mitigation Manual, section 8.5.



### ***Somerset Dam Flood Operations Strategies***

119 The Flood Mitigation Manual dictated that, during a Flood Event, Somerset Dam and Wivenhoe Dam were to be operated in conjunction to maximise the overall flood mitigation capabilities of the two dams.

#### **PARTICULARS**

A. Flood Mitigation Manual, section 1.1, 9.1.

120 The Flood Mitigation Manual specified three Flood Operations strategies for Somerset Dam during a Flood Event:

- a) Strategy S1;
- b) Strategy S2; and
- c) Strategy S3.

121 The Flood Mitigation Manual required the Flood Engineers to select the appropriate strategy taking into account:

- a) the objectives of the Flood Mitigation Manual pleaded in paragraph 88 and their relative importance; and
- b) predictions as to the maximum storage levels of Lake Wivenhoe and Lake Somerset, where such predictions were to be made using the best forecast rainfall and stream flow information available at the time.

#### **PARTICULARS**

A. Flood Mitigation Manual, section 9.3.

122 Further, the Flood Mitigation Manual required the Flood Engineers to change strategies for Somerset Dam as necessary in response to changing rainfall forecasts and stream flow conditions, and in order to maximise the flood mitigation benefits of Somerset Dam and Wivenhoe Dam.

#### **PARTICULARS**

A. Flood Mitigation Manual, section 9.3.

123 The Flood Mitigation Manual required that releases commence at Somerset Dam once the water level in Lake Somerset was expected to exceed EL 99.0 m AHD.

**PARTICULARS**

A. Flood Mitigation Manual, section 9.2.

124 The Flood Mitigation Manual required the Flood Engineers to select Strategy S1 where:

- a) the water level of Lake Somerset was expected to exceed Full Supply Level (EL 99.0 m AHD); and
- b) the water level of Lake Wivenhoe was expected to be less than the Full Supply Level for Wivenhoe Dam (EL 67.0 m AHD).

**PARTICULARS**

A. Flood Mitigation Manual, section 9.3.

125 Under Strategy S1, the Flood Engineers were required to raise the crest gates to enable the uncontrolled discharge of water from Lake Somerset at a rate not exceeding the peak rate of inflow into Lake Somerset.

**PARTICULARS**

A. Flood Mitigation Manual, section 9.3.

126 The intent of the Strategy S1 specified in the Flood Mitigation Manual was returning Somerset Dam to Full Supply Level, while minimising the impact on rural life upstream of the dam, and taking into account the environmental impacts of the releases.

**PARTICULARS**

A. Flood Mitigation Manual, section 9.3.

127 The Flood Mitigation Manual required the Flood Engineers to select Strategy S2 where:

- a) the water level of Lake Somerset was expected to exceed Full Supply Level (EL 99.0 m AHD); and

- b) the water level of Lake Wivenhoe was expected to exceed its Full Supply Level (EL 67.0 m AHD) but not to exceed EL 75.5 m AHD during the course of the Flood Event.

**PARTICULARS**

- A. Flood Mitigation Manual, section 9.3.

128 The intent of the Strategy S2 specified in the Flood Mitigation Manual was to maximise the benefits of the flood storage capabilities of Somerset Dam while protecting the structural safety of both Somerset Dam and Wivenhoe Dam.

**PARTICULARS**

- A. Flood Mitigation Manual, section 9.3.

129 Under Strategy S2, the Flood Engineers were required to control releases taking into account the combined effect thereof on the water levels in Lake Somerset and Lake Wivenhoe, and with a view generally to minimising the impact of the Flood Event below Wivenhoe Dam.

**PARTICULARS**

- A. Flood Mitigation Manual, section 9.3.

130 The Flood Mitigation Manual required the Flood Engineers to select Strategy S3 where:

- a) the water level of Lake Somerset was expected to exceed Full Supply Level (EL 99.0 m AHD); and
- b) the water level of Lake Wivenhoe was expected to exceed EL 75.5 m AHD during the course of the Flood Event.

**PARTICULARS**

- A. Flood Mitigation Manual, section 9.3.

131 Under Strategy S3, the Flood Engineers were permitted to depart from the operating protocols under Strategy S2 where necessary to protect the

structural safety of Somerset Dam and to prevent the peak level of Lake Somerset exceeding EL 109.7 m AHD.

**PARTICULARS**

- A. Flood Mitigation Manual, section 9.3.

131A The intent of Strategy S3 specified in the Flood Mitigation Manual was to maximise the benefits of the flood storage capabilities of Somerset Dam while protecting the structural safety of both Somerset Dam and Wivenhoe Dam.

**PARTICULARS**

- A. Flood Mitigation Manual, section 9.3.

132 The Flood Mitigation Manual required that, once a Flood Event and water releases commenced, Flood Operations and water releases were to continue at Somerset Dam until:

- a) the lake level of Lake Somerset returned to Full Supply Level (EL 99.0 m AHD); or
- b) the lake level of Lake Somerset was reduced below Full Supply level where such reduction was necessary to ensure that remaining inflows would not result in Lake Wivenhoe exceeding Full Supply Level at the end of the Flood Event.

**PARTICULARS**

- A. Flood Mitigation Manual, section 9.4.

K The Real Time **Flood Model**

133 At all material times, Seqwater and SunWater maintained and operated a real time flood monitoring and forecasting system in the Brisbane River Basin and the catchments of Somerset Dam and Wivenhoe Dam.

134 That system consisted of more than 100 field stations that automatically recorded rainfall and river heights at selected locations, and which employed radio telemetry to collect, transmit and receive rainfall and stream flow information.

- 135 The data from this real time flood monitoring and forecasting system was transmitted to the Flood Operations Centre operated by SunWater under its Flood Management Services Agreement with Seqwater.
- 136 Once received in the Flood Operations Centre, the data could be processed by the Flood Engineers using a suite of software tools (collectively referred to as the **Real Time Flood Model**) to estimate likely dam inflows and to evaluate a range of possible inflow and release scenarios based on forecast and potential rainfall.
- 137 At all material times in December 2010 and January 2011, the Flood Operations Centre received various weather forecasts from the Bureau of Meteorology, including:
- a) Quantitative Precipitation Forecasts (**QPFs**) (provided twice a day);
  - b) operational forecasting and warning products;
  - c) multi-day rainfall forecasts;
  - d) flood model results;
  - e) direct telephone briefings and email communications; and
  - f) ad hoc forecast scenario requests.

#### **PARTICULARS**

- A. Bureau of Meteorology, *Report to Queensland Floods Commission of Inquiry*, March 2011, [243]-[257].
- 138 The QPFs provided by the Bureau of Meteorology predicted average rainfall specifically for the catchment areas of Somerset Dam and Wivenhoe Dam for the following 24 hour period.
- 139 The multi-day rainfall forecasts provided by the Bureau of Meteorology predicted average rainfall over the catchment areas of Somerset Dam and Wivenhoe Dam for the following 4 days and the following 8 days.
- 140 Once received at the Flood Operations Centre, the forecast information provided by the Bureau of Meteorology could be input into the Real Time

Flood Model, which could then model the predicted lake level at Lake Somerset and Lake Wivenhoe based on the amount of rain that had already fallen and the rainfall predicted by the Bureau of Meteorology.

- 141 The Real Time Flood Model, used in conjunction with the forecast information supplied by the Bureau of Meteorology, provided the Flood Engineers with:
- a) the means to make useful predictions as to how past, current and predicted weather conditions would affect water levels in Lake Somerset and Lake Wivenhoe and inflows downstream of Wivenhoe Dam;
  - b) the means to model potential release strategies at Somerset Dam and Wivenhoe Dam so as to make useful predictions as to how those strategies would affect flow rates, water levels and flooding downstream of Wivenhoe Dam;
  - c) the means to evaluate a range of potential release strategies at Somerset Dam and Wivenhoe Dam taking into account past, current and predicted weather conditions; and
  - d) the means to evaluate proposed release strategies at Somerset Dam and Wivenhoe Dam accounting for a range of possible future weather conditions.
- 142 At all material times in December 2010 and January 2011, the Real Time Flood Model was available to the Flood Engineers in conducting Flood Operations at Somerset Dam and Wivenhoe Dam.

#### **PARTICULARS**

- A. *Seqwater, Operation of Wivenhoe Dam and Somerset Dam January 2011 Flood Event: Explanation of Operational Methods and Decision-Making Practices, July 2011, [2.1 - 2.2].*