seqwater
WATER FOR LIFE




# Strategic Asset Management Plan

Department of Environment and Resource Management Submission

**May 2009**

# Strategic Asset Management Plan

# TABLE OF CONTENTS

## LIST OF TABLES



## LIST OF FIGURES

**APPENDICES**

*NOTE:*

*The asset details and much of the other information in this report is sourced from documents available when Seqwater was formed, other documentation and preliminary assessments made by Seqwater.*

*The information provided is yet to be verified by Seqwater. Future versions of the Strategic Asset Management Plan will include updated details where available.*

# 1. BACKGROUND

## 1.1 Introduction

Seqwater has prepared its first Strategic Asset Management Plan in accordance with the requirements of the *Water Supply (Safety and Reliability Act) 2008* and the guidelines set out by the Department of Environment and Resource Management (DERM).

## 1.2 South East Queensland Water Industry Reform

In response to the severe drought experienced in South East Queensland from 2005-2008, the State Government has undertaken a series of significant infrastructure projects to improve the water security in the South East Queensland Region. These include new water supply sources, such as desalination and new dams, and the construction of a regional Water Grid pipe network to improve the capacity to transport water between the urban centres.

The State Government also established the Queensland Water Commission (QWC) in 2006. The government charged the QWC with developing a response to the drought, and reviewing the ownership and control of water supply and wastewater assets in South East Queensland.

The QWC announced proposed changes for the South East Queensland water industry in May 2007. Following a brief period of consultation, the government passed the *South East Queensland Water (Restructuring) Act* 2007. The Act established four new statutory authorities:

- Queensland Bulk Water Supply Authority (trading as Seqwater);
- Queensland Bulk Water Transport Authority (trading as LinkWater);
- Queensland Manufactured Water Authority (trading as WaterSecure); and
- SEQ Water Grid Manager (the Water Grid Manager or SEQWGM).

All four authorities are owned by the State Government.

Seqwater came into being in November 2007. The transfer of ownership and operation of assets took place in several steps up until 1 July 2008.

Seqwater has taken over the:

- The three dams formerly owned by the former SEQ Water Corporation;
- The assets formerly owned by Aquagen;
- The dams, weirs, irrigation and stock watering schemes in the South East Queensland region formerly owned by SunWater;
- Several local assets owned by the former Department of Natural Resources and Water;
- The bulk water supply assets (dams, treatment plants, borefields) formerly owned by local governments in the South East Queensland region.

Table 1-1 lists the local government organisations that contributed assets and people to Seqwater. Many of the local governments were amalgamated on 15 March 2008.

**Table 1-1 Local Government Contributing Assets and People to Seqwater**

| Originating Local Government Organisation | New Local Government following Amalgamations[1] |
|---|---|
| Caboolture Shire | Moreton Bay Regional Council |
| Pine Rivers | |
| Caloundra City Council | Sunshine Coast Regional Council |
| Aquagen | |
| Maroochy Shire Council | |
| Noosa Shire Council | |
| Esk Shire Council | Somerset Regional Council |
| Kilcoy Shire Council | |
| Esk Gatton Laidley Water Board | |
| Beaudesert Shire Council | Scenic Rim Regional Council |
| Boonah Shire Council | |
| Redland City Council | Redland City Council |
| Logan City Council | Logan City Council |
| Gold Coast City Council | Gold Coast City Council |
| Brisbane City Council | Brisbane City Council |

LinkWater, WaterSecure and the Water Grid Manager have also now been formed.

The *Water Act* 2000[2] establishes a Water Market in South East Queensland and sets out many of the functions and powers of the Water Grid Manager within the Water Market. The same legislation also gives the Minister of Natural Resources, Mines and Energy the right to establish Market Rules. The Market Rules set out the relationships between Seqwater and the other market participants.

The Water Grid Manager contracts Seqwater to provide storage, treatment and delivery to the Bulk Supply Points[3] nominated in the Grid Contract. Seqwater physically supplies water to LinkWater and a number of local governments throughout the region on behalf of the Water Grid Manager. WaterSecure also supplies water.

Figure 1-1 depicts the relationship that currently exists between the Grid Participants.

[1] The main successor organisation is shown. Some local government areas were split. E.g. Parts of the previous Beaudesert Shire and Gold Coast City Council areas are now in an expanded Logan City Council.
[2] The *Water Supply (Safety and Reliability) Act* 2008 amended the *Water Act* to include the sections relating to the Water Grid Manager and the Market Rules.
[3] Bulk Supply Points are defined within the Market Rules as "the point at which water leaves Water Supply Works owned by a Grid Service Provider for supply to Water Supply Works owned by another Grid Service Provider or a Grid Customer or Distribution Service Provider."

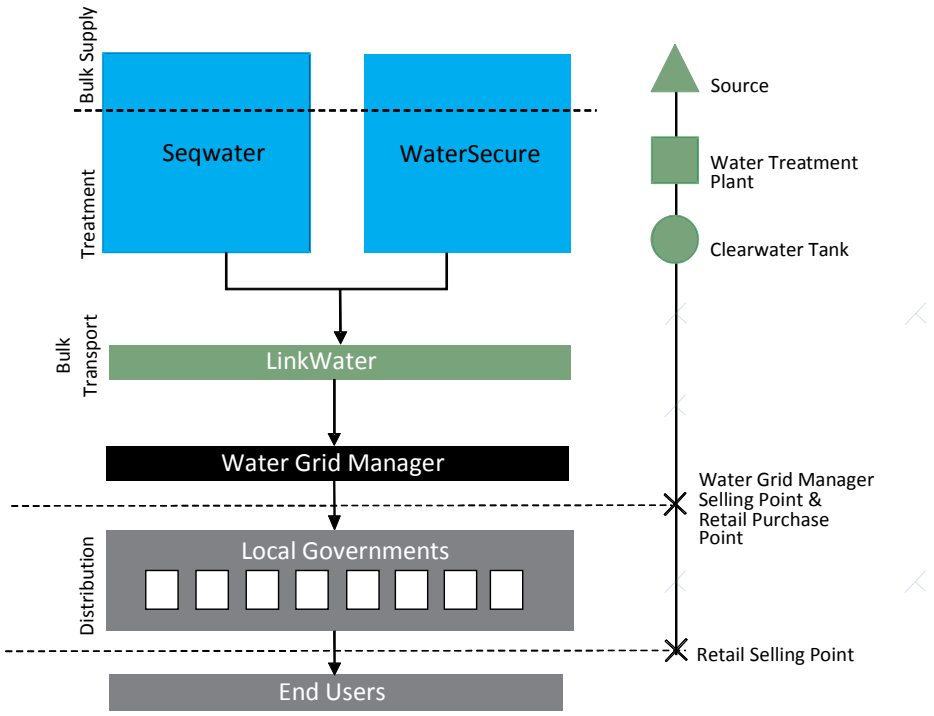


**Figure 1-1 Current Water Grid Relationships**

The second stage of reform is scheduled to be complete by July 2010. The second stage of the reform will create:

- A new distribution entity (jointly owned by all the local governments in South East Queensland) which will own and operate the water supply distribution assets (including local reservoirs, pump stations and pipes) across the region;
- A number of water retailers, who will interface with customers.

This part of the reform will not directly affect Seqwater.

However, once it is completed, Seqwater will physically supply water to the new distribution entity (as well as LinkWater), rather than to the local governments as it does now. The contractual relationship for the supply will still be with the Water Grid Manager. Seqwater may also continue some other contractual relationships that it has with the local governments for the supply of maintenance and other services.

Figure 1-2 depicts the relationship that will exist between the different participants once the second stage of reform is completed.

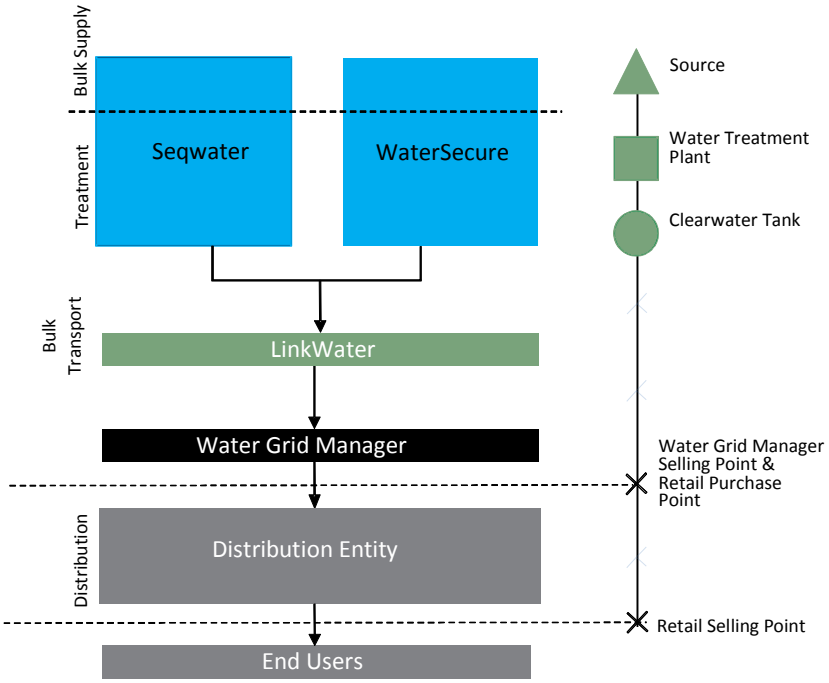


**Figure 1-2 Future Water Grid Relationships**

Seqwater must co-ordinate with a number of other market participants to carry out typical asset management functions:

- Seqwater has operational relationships with the SEQWGM, LinkWater, the local governments, and in the future, the proposed distribution entity;
- Seqwater must notify the SEQWGM, LinkWater, the local governments and in the future the proposed distribution entity when it proposes to carry out major maintenance activities. The operational response for major unplanned maintenance will require co-ordination with LinkWater and the local distributor (the local government now, and the future distribution entity);
- The QWC currently has a responsibility to undertake major source planning;
- Seqwater must co-ordinate risk management plans with the SEQWGM, LinkWater, Water Secure, the local governments (at present), and the proposed distribution entity (in the future)[4];
- Seqwater must co-ordinate it's Drinking Water Quality Management Plans with the SEQWGM and other Grid Participants.

The operational aspects of the Water Grid, as set out in the Market Rules are summarised in section 7.1.

[4] The Water Grid Manager is preparing a Water Grid Emergency Response Plan and Water Grid Risk Management Plan. Seqwater must prepare and maintain a Grid Service Provider Emergency Response Plan and Grid Participant Risk Management Strategy.

In the case of irrigation and stock watering, Seqwater supplies water directly to the customers.

## 1.3 Organisational Arrangements

### 1.3.1 Organisational Structure

The overall Seqwater organisational structure is shown in Figure 1-3.

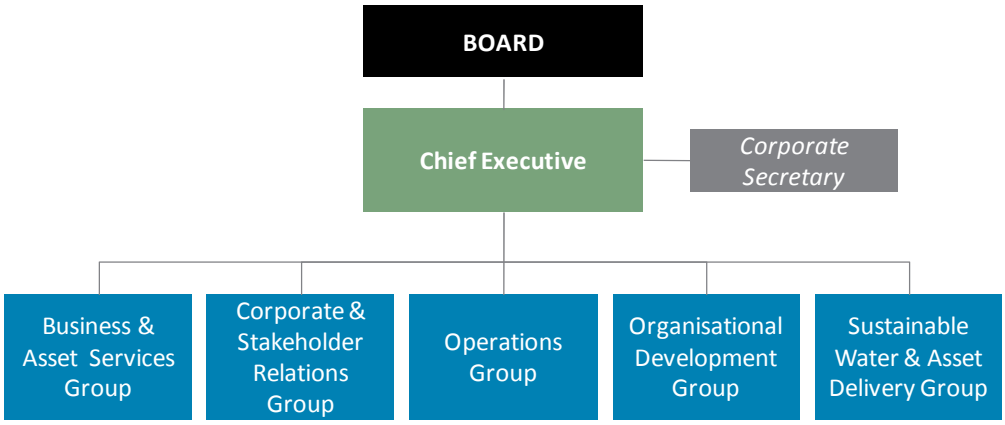


**Figure 1-3 Seqwater Organisational Structure**

The three groups with direct asset management responsibilities are the:

- Sustainable Water and Asset Delivery Group;
- Business and Asset Services Group; and
- Operations Group.

The functions of these three groups are discussed further in section 7.6.

### 1.3.2 Business Formation and Development of Functions

From an asset management perspective, the formation of Seqwater poses a considerable number of challenges.

Seqwater undertakes a number of asset management functions including:

- The operation and maintenance of the assets;
- Identification, planning and execution of renewals, new works and augmentations; and
- Adoption of improved business practices.

Many of the staff directly involved with the operation of the assets with the previous owners transferred to Seqwater to undertake similar or in many cases exactly the same

roles at the same sites with Seqwater. Many, if not most, of the sites had well documented operational procedures which are still relevant and applicable.

There has been some redistribution of roles to balance the workloads amongst the operators, and there will be some operational changes as processes are improved at some of the more remote and smaller sites. Furthermore, as previously outlined in section 1.2, the Market Rules and the Water Grid have created a new operating environment for the assets. Nevertheless, the operations function has been transferred relatively intact from the previous owners.

The procedures and operating practices do vary from location to location, and over time Seqwater will seek to standardise the operational procedures to the extent possible[5]. Seqwater will also improve those procedures to adopt improved practices as required by legislation and to meet the requirements of the SEQWGM.

For the other asset management functions, staff in the previous organisations often held roles which related both to bulk water assets and assets that have remained with the previous owners. Those staff either did not transfer to Seqwater, or where they did transfer, in many cases they were initially familiar with only some of the assets for which they now have responsibility. For example, many of the maintenance staff in the previous organisations had responsibility for water distribution and sewerage assets as well as bulk water assets, and only some of those staff transferred to Seqwater.

Similarly, much of the corporate knowledge for the planning of new works, enhancements, renewals and maintenance has stayed with the previous owners.

Our asset management Action Plan includes key steps towards the harmonisation and integration of operating functions and the development of the required corporate knowledge for the other asset management functions. The improvements will be aligned with broad organisational initiatives to develop whole of system approaches to risk, compliance, asset management, systems, policies and procedures.

[5] The operating environment and design approach typically varies from facility to facility.

# 2. OVERVIEW OF SCHEMES OPERATED BY SEQWATER

Seqwater provides bulk water supply across South East Queensland. It also operates a number of irrigation and stock watering schemes.

**Table 2-1 Services Provided by Catchment**

| Catchment | Bulk Water Supply & Treatment | Surface Water Irrigation and Stock Watering | Groundwater Irrigation and Stock Watering |
|---|---|---|---|
| Nerang River | x | | |
| Logan / Albert Rivers | x | x | |
| Warrill Valley | x | x | |
| Lockyer Valley | x | x | x |
| Upper Brisbane River | x | | |
| Stanley River | x | | |
| Mary Valley | x | x | |
| Maroochy River | x | | |
| Mooloolah River | x | | |
| Bribie Island Groundwater | x | | |
| Caboolture River | x | | |
| North Pine River | x | | |
| North Stradbroke Island Groundwater | x | | |
| Tingalpa Creek | x | | |
| Lower Brisbane River | x | | |
| Brisbane Groundwater | x | | |

# 3. NATURE AND EXTENT OF SERVICE

The assets operated by Seqwater have been grouped together on a catchment basis.

The catchment definitions throughout this document are for the most part based on DERM catchment and sub-catchment boundaries where appropriate. In some cases, areas within the wider catchment boundaries have been adopted. The catchments are defined in Table 3-1.

**Table 3-1 Catchment Definitions**

| Catchment | Facility Type |
|---|---|
| Nerang River | The DERM Gold Coast catchment |
| Logan / Albert Rivers | The DERM Logan catchment[6] |
| Warrill Valley | The Bremer sub-catchment of the DERM Moreton catchment |
| Lockyer Valley | The Lockyer sub-catchment of the DERM Moreton catchment |
| Upper Brisbane River | The Upper Brisbane sub-catchment of the DERM Moreton catchment |
| Stanley River | The Stanley sub-catchment of the DERM Moreton catchment |
| Mary Valley | The part of the DERM Mary Valley catchment in the area served by Seqwater |
| Maroochy River | The catchment for the Maroochy River |
| Mooloolah River | The catchment for the Mooloolah River |
| Bribie Island Groundwater[7] | The facilities owned by Seqwater on Bribie Island |
| Caboolture River | The Caboolture sub-catchment of the DERM Moreton catchment |
| North Pine River | The Pine sub-catchment of the DERM Moreton catchment |
| North Stradbroke Island Groundwater | The facilities owned by Seqwater on North Stradbroke Island |
| Tingalpa Creek | Capalaba WTP and Leslie Harrison Dam |
| Lower Brisbane River | The Lower Brisbane sub-catchment of the DERM Moreton catchment[8] |
| Brisbane Groundwater | Algester, Chandler, Forest Lake, Runcorn and Sunnybank treatment plants (the 'Brisbane Aquifers' plants) and associated infrastructure |

The total numbers of assets that Seqwater manages are listed in Table 3-2.

[6] But it excludes those assets that have been identified in the Tingalpa Creek and Brisbane Groundwater catchments.
[7] The Bribie Island Groundwater, North Stradbroke Island Groundwater and Brisbane Groundwater catchments listed in this table are not catchments in the usual sense, but the term has been adopted throughout this report for consistency.
[8] But it excludes those assets that have been identified in the Brisbane Groundwater catchment.

**Table 3-2 Asset Numbers**

| Asset Type | Number[9] |
|---|---|
| Dams | 25 |
| Water Treatment Plants | 49 |
| Weirs | 47 |
| Reservoirs | 68 |
| Pump Stations | 39 |
| Pipelines | 23 |
| Irrigation Channels | 11 |
| Off-Stream Storages | 3 |
| Lagoons | 2 |
| Major River Intakes | 2 |

The treatment plants, dams and weirs are listed by catchment in Table 3-3.

**Table 3-3 Major Facilities**

| Catchment | Facility Type | Name | Local Government Area | Connected to LinkWater / Local Facilities[10] |
|---|---|---|---|---|
| Nerang River | Source | Hinze Dam | Gold Coast City Council | Y |
| | Source | Little Nerang Dam | | Y |
| | WTP | Molendinar WTP | | Y |
| | WTP | Mudgeeraba WTP | | Y |
| | WTP | Hinze Dam WTP | | L |
| Logan / Albert Rivers | Source | Bromelton Off-Stream Storage[11] | Scenic Rim Regional Council | N |
| | Source | Maroon Dam | | N |
| | WTP | Kooralbyn WTP | | N |
| | WTP | Canungra WTP | | N |
| | WTP | Rathdowney WTP | | N |
| | WTP | Beaudesert WTP | | N |

[9] These figures are based on the tables in section 5. The dams total includes the Bromelton and Nindooninbah Off-Stream Storages, both of which are referable dams under dam safety regulations. These two assets are not counted in the off-stream storage total. The treatment plant total includes all the treatment plants listed in Table 3-3 including those denoted as local facilities. For the purposes of this count, North Stradbroke Island WTP has been counted as one facility, whereas Mt Crosby East Bank and Mt Crosby West Bank have been counted as separate facilities. The pipelines total includes only those pipelines listed and as defined in Table 5-4.

[10] For the purposes of this table, a 'Y' denotes facilities scheduled to be directly connected to or connected by significant trunk mains to LinkWater pipelines at 1 July 2009 and the major associated dams. An 'L' denotes water treatment plants that are not part of the Water Grid and serve only local facilities and limited adjacent landholders. (N.B. The formal definition of the Water Grid is provided in the Market Rules, as "Water Supply Works within the SEQ Region that are used to provide a Declared Water Service." It is understood that all of Seqwater's bulk supply assets are a Declared Water Service in terms of the Water Act.)

[11] The Bromelton Off-Stream Storage is operated by Seqwater at present. Seqwater will assume ownership of the facility on 1 July 2009.

| Catchment | Facility Type | Name | Local Government Area | Connected to LinkWater / Local Facilities[10] |
|---|---|---|---|---|
| | WTP | Maroon Dam WTP | | L |
| | Source | Nindooninbah Off-Stream Storage | | N |
| | Source | Bigfoot Lagoon | | N |
| | Weir | Bromelton Weir | | N |
| | WTP | South Maclean WTP | Logan City Council | Y |
| | Weir | Cedar Grove Weir | | N |
| | Weir | South Maclean Weir | | N |
| Warrill Valley | Source | Moogerah Dam | Scenic Rim Regional Council | N |
| | WTP | Boonah-Kalbar WTP | | N |
| | WTP | Moogerah Dam WTP | | L |
| | WTP | Aratula WTP | | N |
| | Weir | Aratula Weir | | N |
| | Weir | Churchbank Weir | | N |
| | Weir | Kents Lagoon Diversion Weir | | N |
| | Weir | Railway Weir | | N |
| | Weir | Upper Warrill Diversion Weir | | N |
| | Weir | Warrill Creek Diversion Weir (Junction Weir) | | N |
| | Weir | Warroolaba Creek Diversion Weir | | N |
| | Weir | West Branch Warrill Diversion Weir | | N |
| Lockyer Valley (Lower Lockyer) | Source | Atkinson Dam | Somerset Regional Council | N |
| | WTP | Atkinson Dam (Recreation) WTP | | L |
| | Weir | Brightview Weir | | N |
| | Weir | Buaraba Creek Diversion Weir | | N |
| | Weir | Sippels Weir | | N |
| | Weir | Potters Weir | | N |
| | Weir | O'Reillys Weir | | N |
| | Source | Seven Mile Lagoon | Lockyer Valley Regional Council | N |
| Lockyer Valley (Central Lockyer) | Source | Clarendon Dam | Lockyer Valley Regional Council | N |
| | Source | Bill Gunn Dam | | N |
| | Weir | Jordan I Weir | | N |
| | Weir | Jordan II Weir | | N |
| | Weir | Wilson Weir (Gatton College Weir) | | N |
| | Weir | Clarendon Weir | | N |

| Catchment | Facility Type | Name | Local Government Area | Connected to LinkWater / Local Facilities[10] |
|---|---|---|---|---|
| | Weir | Glenore Grove Weir | | N |
| | Weir | Kentville Weir | | N |
| | Weir | Laidley Creek Diversion Weir | | N |
| | Weir | Showgrounds Weir | | N |
| | Weir | Crowley Vale Weir | | N |
| | Weir | Lower Flagstone Creek Weir | | N |
| | Weir | Flagstone Creek Weir | | N |
| | Weir | Mulgowie Weir | | N |
| | Weir | Gatton Weir | | N |
| | Weir | Grantham Weir | | N |
| | Weir | Carpendale Weir | | N |
| | Weir | Ma Ma Creek Weir | | N |
| | Weir | Redbank Creek Weir | | N |
| | Weir | Sandy Creek Weir | | N |
| | Weir | Lower Tenthill Creek Weir | | N |
| | Weir | Tenthill Creek Weir | | N |
| Upper Brisbane River | Source | Wivenhoe Dam | Somerset Regional Council | Y |
| | WTP | Lowood WTP | | N |
| | WTP | Linville WTP | | N |
| | WTP | Esk WTP | | N |
| | WTP | Wivenhoe (Recreation) WTP | | L |
| | Source | Lowood River Intake | | N |
| | Source | Lake Manchester Dam | Brisbane City Council | Y |
| | WTP | Mt Crosby East Bank WTP | | Y |
| | WTP | Mt Crosby West Bank WTP | | Y |
| | Weir | Mt Crosby Weir | | N |
| Stanley River | Source | Somerset Dam | Somerset Regional Council | Y |
| | WTP | Kilcoy WTP | | N |
| | WTP | Kilcoy (Lake Somerset) WTP | | N |
| | WTP | Kirkleagh (Recreation) WTP | | L |
| | WTP | Somerset Dam Township WTP | | N |
| | Source | Kilcoy Off-Stream Storage | | N |
| | Weir | Kilcoy Creek Weir | | N |
| | WTP | Woodford WTP | Moreton Bay | N |

| Catchment | Facility Type | Name | Local Government Area | Connected to LinkWater / Local Facilities[10] |
|---|---|---|---|---|
| | Source | Woodford Off-Stream Storage | Regional Council | N |
| | Weir | Stanley River Weir (Woodford Weir) | | N |
| Mary Valley | Source | Lake MacDonald Dam | Sunshine Coast Regional Council | N |
| | Source | Baroon Pocket Dam | | Y |
| | WTP | Noosa WTP | | N |
| | WTP | Landers Shute WTP | | Y |
| | WTP | Maleny WTP | | N |
| | WTP | Kenilworth WTP | | N |
| | Weir | Maleny Weir (Weir No. 2) | | N |
| | Weir | Obi Obi Creek Weir (Weir No. 1) | | N |
| | Source | Borumba Dam | Gympie Regional Council | N |
| | Source | Cedar Pocket Dam | | N |
| | WTP | Borumba Dam WTP | | L |
| | Source | Mary River Intake | | N |
| | Weir | Imbil Weir | | N |
| | WTP | Jimna WTP | Somerset Regional Council | N |
| | Weir | Yabba Creek Weir (Jimna Weir) | | N |
| Maroochy River | Source | Cooloolabin Dam | Sunshine Coast Regional Council | N |
| | Source | Poona Dam | | N |
| | Source | Wappa Dam | | N |
| | WTP | Image Flat WTP | | N |
| | Weir | South Maroochy Intake Weir | | N |
| Mooloolah River | Source | Ewen Maddock Dam | Sunshine Coast Regional Council | Y |
| | WTP | Ewen Maddock WTP | | Y |
| Bribie Island Groundwater | WTP | Banksia Beach WTP | Moreton Bay Regional Council | N |
| | WTP | Woorim WTP | | N |
| Caboolture | WTP | Caboolture WTP | Moreton Bay Regional Council | Y |
| | Source | Moodlu Quarry Off-Stream Storage | | N |
| | Weir | Caboolture River Weir | | N |
| | Weir | Waraba Creek Weir | | N |
| North Pine River | Source | North Pine Dam | Moreton Bay Regional | Y |
| | Source | Sideling Creek Dam | | Y |

| Catchment | Facility Type | Name | Local Government Area | Connected to LinkWater / Local Facilities[10] |
|---|---|---|---|---|
| | WTP | North Pine WTP | Council | Y |
| | WTP | Petrie WTP | | Y |
| | WTP | Dayboro WTP | | N |
| | Weir | Dayboro Road Pump Station Weir | | N |
| North Stradbroke Island Groundwater | WTP | Dunwich WTP | Redland Shire Council | N |
| | WTP | Amity Point WTP | | N |
| | WTP | Point Lookout WTP | | N |
| | WTP | North Stradbroke Island WTP | | Y |
| Tingalpa Creek | Source | Leslie Harrison Dam | Redland Shire Council | Y |
| | WTP | Capalaba WTP | | Y |
| Lower Brisbane River | Source | Enoggera Dam | Brisbane City Council | Y |
| | Source | Gold Creek Dam | | N |
| | WTP | Enoggera WTP | | Y |
| Brisbane Groundwater | WTP | Algester WTP | Brisbane City Council | N |
| | WTP | Chandler WTP | | N |
| | WTP | Forest Lake WTP | | N |
| | WTP | Runcorn WTP | | N |
| | WTP | Sunnybank WTP | | N |

Maps of the assets included in each catchment are included in Appendix A.

Table 3-4 and Table 3-5 show the water entitlements for these catchments.

**Table 3-4 IROL Based Water Entitlements**

| Catchment / Facility | Customer Volume (ML) | SEQWGM Volume (ML) | Seqwater Volume (ML) | Total (ML)[12] |
|---|---|---|---|---|
| Nerang River | - | 76,295 | 5 (HP[13]) | 76,300 |
| Logan / Albert Rivers | 936 (HP) | 18,910 (HP)[14] | 10 (HP) | 33,413 |
| | 13,557 (MP) | | | |
| Warrill Valley | 20,536 (MP) | 9,450 | 3,714 (MP) | 33,700 |
| Lockyer Valley (Lower Lockyer) | 11,268 (MP) | - | 1,510 (MP) | 12,778 |

[12] Given the water sharing rules in the relevant IROL, these volumes are only a cap on the water that may become available in any one year.
[13] HP = high priority, MP = medium priority, GW = groundwater
[14] Includes 10,000ML to be issued in conjunction with Bromelton Offstream Storage and Cedar Grove Weir

| Catchment / Facility | Customer Volume (ML) | SEQWGM Volume (ML) | Seqwater Volume (ML) | Total (ML)[12] |
|---|---|---|---|---|
| Lockyer Valley (Central Lockyer) | 3,507 (MP) | - | 184 (HP) | 16,541 |
| | 3,510 (Risk-A & Risk-B) | | | |
| | 9,340 (GW) | | | |
| Upper Brisbane River / Stanley River (Wivenhoe / Somerset) | - | 278,900 (HP)[15] | - | 278,900 |
| Upper Brisbane (Mid Brisbane River) | 7,141 (MP) | - | - | 7,000 |
| Mary Valley (Baroon Pocket) | 2,000 (Other) | 36,495 | 5 (HP) | 38,500 |
| Mary Valley (Mary River) | 3,584 (HP) | 6,500 (HP) | 180 (HP) | 32,715 |
| | 19,025 (MP) | | 3,426 (MP)[16] | |
| North Pine River | - | 59,000 | - | 59,000 |

**Table 3-5 Licence Based Water Entitlements**

| Catchment / Facility | Facility / Watercourse | SEQWGM Volume (ML) | Seqwater Volume (ML) | Total (ML) |
|---|---|---|---|---|
| Logan / Albert Rivers | Albert River | 682 | - | 682 |
| Upper Brisbane River | Lake Manchester | -[17] | - | - |
| Stanley River | Kilcoy Weir | 1,100 | - | 1,100 |
| Mary Valley | Lake MacDonald | 3,495 | 5 | 3,500 |
| | Obi Obi Creek | 125 | - | 125 |
| | Mary River | 220 | - | 220 |
| Maroochy River | Wappa, Poona & Cooloolabin Dams | 16,500 | - | 16,500 |
| Mooloolah River | Ewan Maddock Dam | 445 | - | 445 |
| | Mooloolah River | 3,870 | - | 3,870 |
| Caboolture | Caboolture Weir | 3,600 | - | 3,600 |
| | Waraba Creek Weir | -[18] | - | - |

[15] The current regulation specifies 338,000 ML across Wivenhoe / Somerset / North Pine for the SEQWGM and 7,000 for customers in the Mid-Brisbane. The draft Moreton ROP specifies the following volume split: Wivenhoe/Somerset (278,725ML-WGM, 175ML-Seqwater, 7141ML-Customers) and Pine River (59,000ML-WGM). The figures in the above table are based upon the draft ROP, as this provides a split between the allocation for Wivenhoe/Somerset and North Pine. The total shown is 41 ML greater than the current allocation.
[16] The final MP entitlement is still to be confirmed.
[17] The draft Moreton ROP nominates the volume of 5,800ML.
[18] The draft Moreton ROP nominates the volume of 600ML.

| Catchment / Facility | Facility / Watercourse | SEQWGM Volume (ML) | Seqwater Volume (ML) | Total (ML) |
|---|---|---|---|---|
| North Pine River | Sideling Creek Dam (Lake Kurwongbah) | 5,682[19] | - | 5,682 |
| Tingalpa Creek | Leslie Harrison Dam | 11,842[20] | - | 11,842 |
| Lower Brisbane River | Enoggera Dam | -[21] | - | - |
| | Gold Creek Dam | -[22] | - | - |

## 3.1 Catchment Descriptions

The major storage on the **Nerang River** is the Hinze Dam. The Little Nerang Dam, further upstream provides a secondary storage. Mudgeeraba WTP can be supplied both from the Little Nerang Dam by gravity, and the upper intake in the Hinze Dam reservoir via a pumped rising main. The Molendinar WTP is served from the lower intake on the Hinze Dam. The treatment plants are located a number of kilometres from the dams.

There is also a small package plant water treatment plant at Hinze Dam which is used to supply water to the recreation facilities and ranger's buildings.

The **Logan** / **Albert Rivers** catchment includes the bulk water facilities along the Albert River, and the Logan River scheme. The latter is a multipurpose scheme that was built to secure water for irrigation[23], industrial, and urban use along Burnett Creek and Logan River. The scheme supplies bulk water to the town of Beaudesert and other local industries. The main storage in the scheme is Maroon Dam. The Bromelton Weir, Bromelton Off-Stream Storage, Cedar Grove and South Maclean Weirs provide further storage along the river.

The South Maclean WTP draws water from the Logan River at South Maclean Weir. The Beaudesert, Kooralbyn and Rathdowney water treatment plants also draw water from the Logan River and its tributaries. There is also a small package plant water treatment plant at Maroon Dam.

There is a significant off-stream storage at Nindooninbah adjacent to Beaudesert, and a minor off-stream storage at the Bigfoot Lagoon in Kooralbyn.

The **Warrill Valley** catchment comprises Moogerah Dam, which regulates supplies along Reynolds and Warrill Creeks to supply water for irrigation. The dam also supplies raw water for the townships of Boonah and Kalbar. The Boonah-Kalbar WTP is located on Reynolds Creek downstream of the dams. There is also a small package plant water treatment plant at Moogerah Dam. The catchment also includes an irrigation scheme consisting of a series of control weirs that divert water into anabranches and other features to supply landholders.

[19] The draft Moreton ROP nominates the volume of 7,000ML.
[20] The draft Moreton ROP nominates the volume of 7,640ML.
[21] The draft Moreton ROP nominates the volume of 1,700ML.
[22] The draft Moreton ROP nominates the volume of 520ML.
[23] Throughout this document, irrigation may mean irrigation and stock watering.

The **Lockyer Valley** catchment includes the Lower Lockyer and Central Lockyer Schemes.

The Lower Lockyer scheme supplies water for irrigation, stock and domestic use in the downstream part of the Lockyer Valley area. It includes Atkinson Dam, five regulating weirs and a small channel distribution system.

The Central Lockyer scheme includes the irrigation schemes around the Clarendon and Bill Gunn Dams, and a number of groundwater recharge weirs above both dams.

The Clarendon scheme includes the Clarendon Dam (including diversion and return works with Lockyer and Redbank Creeks), two pump stations and a series of diverting, recharging, and regulating weirs. The Morton Vale pipe distribution scheme is also supplied from the Clarendon Dam.

The Bill Gunn irrigation scheme consists of Bill Gunn Dam, diversion and return works with Laidley Creek, and a series of diverting, recharging, and regulating weirs.

There is also a small package plant water treatment plant at Atkinson Dam.

The major storage for Brisbane is Wivenhoe Dam, situated on the **Upper Brisbane River.** The dam regulates releases to supply the major treatment plants at Mt Crosby East Bank and Mt Crosby West Bank. The treatment plants draw water from the river at the Mt Crosby Weir. The treatment plants are interconnected.

Lowood WTP draws water from the river between Wivenhoe Dam and Mt Crosby. Linvile WTP draws water from bores close to the river upstream of the dam. Esk WTP also draws water from the dam via a pipeline.

There is also a small package plant water treatment plant at the southern tip of Wivenhoe Dam provided for the camping facilities.

Somerset Dam on the **Stanley River** releases water into Wivenhoe Dam, and together provides the bulk of the water storage for South East Queensland.

The Woodford WTP is located further upstream on the Stanley River. There is also an off-stream storage near the plant. Likewise, the Kilcoy WTP can draw water from either the Kilcoy Creek or the small off-stream storage there.

There are also several small package plants around Lake Somerset.

Seqwater has a number of facilities located in the **Mary Valley** catchment.

The Landers Shute WTP is supplied from Baroon Pocket Dam via the Blackall Range tunnel. The Maleny WTP and two weirs are located on the Obi Obi Creek above the dam.

The Borumba Dam on the Yabba Creek is the main storage regulating flows along the Mary River. The small Jimna WTP and associated weir are situated above the dam. The Imbil Weir provides additional storage further downstream of the dam.

There is a river intake on the Mary River, below the junction with the Yabba Creek, to pump water up to the reservoir formed by the Lake MacDonald Dam on Six Mile Creek. The Noosa WTP is situated at Lake MacDonald, and can draw water either directly from the dam or the Mary River. There are also some off-takes off the pipeline.

The small Kenilworth WTP is situated on the upper reaches of the Mary River and is fed by a bore close to the river. There is also a small package plant located at the Borumba Dam.

The catchment also includes the Pie Creek irrigation scheme. The Pie Creek main channel supplements a number of local streams. Seqwater also owns the Cedar Pocket Dam which stores water for local stock watering.

The Image Flat WTP is the main treatment facility in the **Maroochy River** area. The principal storage is Cooloolabin Dam. The dam can release water via a gravity main into Low Creek. Water can flow down Low Creek to an intake weir on the South Maroochy River, where it flow by gravity to the small Poona Dam, and then onto the treatment plant. The remainder of the flow in the river is captured by the **Wappa Dam** further downstream. The treatment plant can also be supplied via a pumped rising main from the Wappa Dam.

The Ewen Maddock Dam stores water on the **Mooloolah River**. The new Ewen Maddock WTP adjacent to the dam is currently being completed.

The **Bribie Island Groundwater** scheme consists of a network of bores and pipework feeding the new Banksia Beach WTP, and another supplying Woorim WTP.

The Moodlu Creek Off-Stream Storage provides storage for the **Caboolture River**. The Caboolture WTP draws water from the reservoir formed by the Caboolture River Weir.

The treatment plant was formerly supplied from the Waraba Weir.

The North Pine Dam is the major storage on the **North Pine River**. The North Pine WTP is supplied from the dam by pump station. The dam and treatment plant are important sources for Brisbane. Petrie WTP, which supplies local areas, can draw water from Sideling Creek Dam and the North Pine River. Dayboro WTP draws water from a borefield adjacent to the river upstream of the North Pine Dam.

The largest plant in the **North Stradbroke Island Groundwater** scheme is North Stradbroke Island WTP. It can be supplied both from bores and from the Herring Lagoon. The treatment plant supplies the mainland Redland City Council area via a submarine pipe owned by LinkWater. There are separate bore systems and treatment plants for the Point Lookout, Amity Point and Dunwich communities.

The main raw water source for the Redland City Council area is the Leslie Harrison Dam on **Tingalpa Creek**. Capalaba WTP is situated a short distance from the dam.

The **Brisbane Groundwater** scheme consists of a network of bores, and five small water treatment plants. The plants were installed as drought relief.

The catchment to the **Lower Brisbane River** includes the Enoggera Dam, on the Enoggera Creek, and the adjacent water treatment plant which provide local water supply. The Gold Creek Dam is no longer used for bulk water supply and the pipeline linking this site to Enoggera Dam is also no longer in service. However, the dam does store water for irrigation purposes.

# 4. PROJECTED FLOWS

Bulk water planning in South East Queensland is undertaken by the QWC.

A copy of figure 4.7 from the draft SEQ Water Strategy[24], which shows the forecast urban demand for South East Queensland, is below as Figure 4-1.

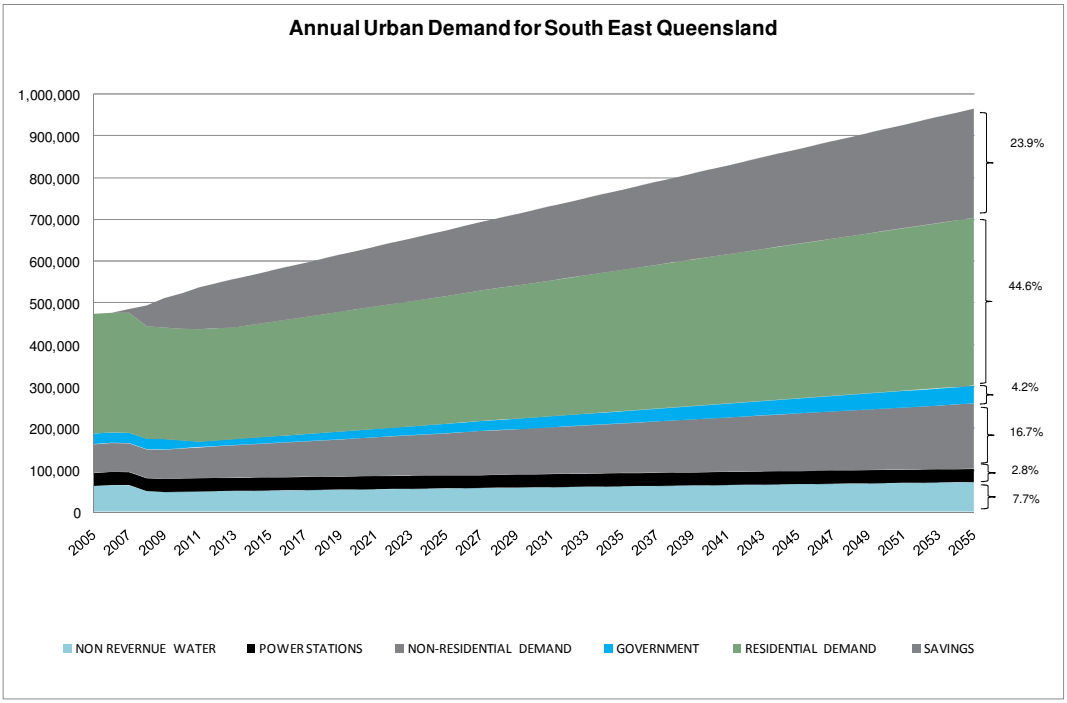


**Figure 4-1 Forecast Total Demand Excluding Water for Rural Production**

[24] *South East Queensland Water Strategy – Draft,* Queensland Water Commission, March 2008. While every effort has been made to ensure the accuracy of this figure, it may not be an exact representation.

# 5. INFRASTRUCTURE DETAILS

Seqwater manages a range of assets including:

- Dams, off-stream storages, weirs, borefields, minor lagoons and river intakes;
- Water treatment plants, pipelines, pump stations and reservoirs;
- A small number of other assets.

Details of these assets are included in the sections that follow.

## 5.1 Dams

Figure 5-1 shows the SEQWGM water allocations for the major catchments and dams. The allocations are those listed for the SEQWGM in Table 3-4 and Table 3-5[25].

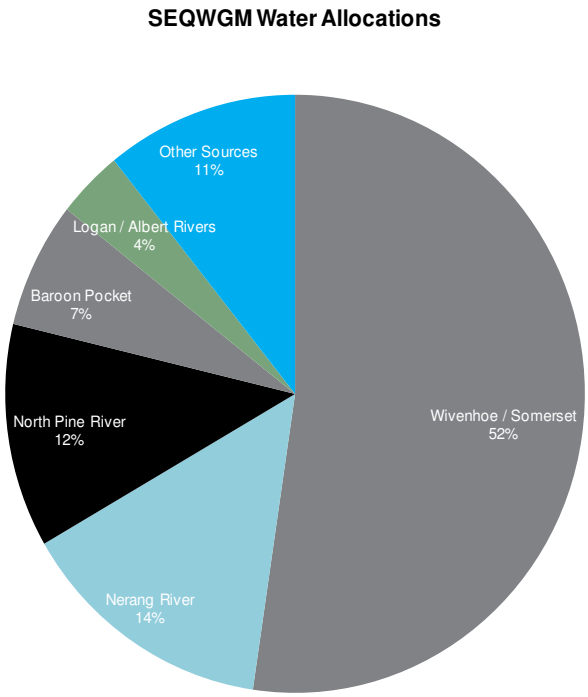


**Figure 5-1 Water Allocations**

The main details of our dams are shown in Table 5-1.

[25] Most of the allocations are for dams, however some allocations for weirs and water courses are included. Yield information determined by the Queensland Water Commission is included for information only in Appendix B.

**Table 5-1 Dams**

| Catchment | Name | Supply Storage Capacity (ML)[26] | Type | Purpose[27] | Installation Year | Condition[28] |
|---|---|---|---|---|---|---|
| Nerang River | Hinze Dam | 161,070 | Earth and rock fill | Bulk water supply for the Gold Coast | 1976 | Good to Excellent |
| | Little Nerang Dam | 8,400 | Concrete gravity | Secondary water supply for the Gold Coast | 1961 | Fair to Good |
| Logan/Albert Rivers | Maroon Dam | 44,320 | Earth and rock fill with weighting zones | Bulk water supply and irrigation | 1974 | Good |
| | Bromelton Dam | 8,600 | Homogenous earth fill | Bulk water supply and irrigation | 2008 | New |
| | Nindooninbah Off-Stream Storage | 322 | - | Bulk water supply and irrigation | - | - |
| Warrill Valley | Moogerah Dam | 83,765 | Concrete arch | Swanbank Power Station supply, irrigation water and local potable water supply | 1961 | Good |
| Lockyer Valley | Atkinson Dam | 30,400 | Earth fill | Irrigation and local potable water supply | 1970 | Good |
| | Clarendon Dam | 24,300 | Earth and rock fill | Irrigation | 1992 | Good |
| | Bill Gunn Dam | 7,520 | Earth and rock fill | Bulk water supply for Laidley and flow regulation for groundwater recharge along Laidley Creek | 1987 | Good |

[26] The figures quoted are for current full supply level. Wivenhoe Dam and Somerset Dam have 1.45 million megalitres and 524,000 megalitres respectively of flood storage capacity above their designated full supply levels. Hinze Dam has a slot in the spillway outlet to attenuate flood flows. The capacity at crest level is 300,500 ML. Works are currently being undertaken at Hinze Dam to raise the full supply level and provide significant additional flood storage capacity there.
[27] The major dams such as Wivenhoe, North Pine, Somerset, Baroon Pocket and Hinze are able to provide bulk water to other major urban areas via the Water Grid.
[28] The condition descriptions shown in this table are based on the condition assessments compiled during the Technical Due Diligence project for Queensland Treasury prior to the formation of Seqwater. Where more than one description is given, it refers to different components of the dam. Some renewals work has been undertaken since the condition assessments used in this table were made.

| Catchment | Name | Supply Storage Capacity (ML)[26] | Type | Purpose[27] | Installation Year | Condition[28] |
|---|---|---|---|---|---|---|
| Upper Brisbane River | Lake Manchester Dam | 26,000 | Concrete gravity | Secondary water supply for Brisbane | 1916 | Good[29] |
| | Wivenhoe Dam | 1,150,000 | Earth and rock fill | Bulk water supply for SE Qld | 1985 | Good to Excellent |
| Stanley River | Somerset Dam | 369,000 | Concrete gravity | Bulk water supply for SE Qld | 1953 | Good |
| Mary Valley | Baroon Pocket Dam | 61,000 | Earth and rock fill | Bulk water supply primarily for the Caloundra and Maroochy areas | 1989 | Good |
| | Lake MacDonald Dam | 8,000 | Earth and rock fill | Bulk water supply for Noosa | 1964 | Good |
| | Borumba Dam | 46,000 | Rock fill with upstream concrete face | Irrigation and bulk water supply for Gympie and Imbil | 1964 | Good |
| | Cedar Pocket Dam | 735 | Concrete gravity with earth fill embankment | Irrigation | 1984 | Good |
| Maroochy River | Cooloolabin Dam | 14,200 | Concrete gravity dam with earth fill abutments on both sides and five earth fill saddle dams | Bulk water supply for the Maroochy areas | 1979 | Good |
| | Poona Dam | 683 | Homogenous earth fill | Bulk water supply for the Maroochy areas | 1959 | Good |
| | Wappa Dam | 4,614 | Concrete gravity arch dam with earth abutments on both sides | Bulk water supply for the Maroochy areas | 1961 | Good |
| Mooloolah River | Ewen Maddock Dam | 16,590 | Earth fill | Bulk water supply | 1976 | Good |

[29] Since the condition assessment was made, works have been completed to raise and strengthen the dam wall and widen the spillway.

| Catchment | Name | Supply Storage Capacity (ML)[26] | Type | Purpose[27] | Installation Year | Condition[28] |
|---|---|---|---|---|---|---|
| North Pine River | North Pine Dam | 215,000 | Concrete gravity dam with earth fill embankments on abutments | Bulk water supply to Brisbane and parts of Moreton Bay Regional Council area | 1976 | Good to Excellent |
| | Sideling Creek Dam | 14,370 | Earth fill | Bulk water supply to Moreton Bay Regional Council area | 1958 | Fair to Good |
| Tingalpa Creek | Leslie Harrison Dam | 24,800 | Earth fill | Bulk water supply (local areas) for the Redland Shire | 1968 | Fair to Good |
| Lower Brisbane River | Enoggera Dam | 4,500 | Earth and rock fill incorporating the original clay core embankment | Secondary water supply for Brisbane | 1866 | Good |
| | Gold Creek Dam | 1,270 | Earth fill | Formerly used for Brisbane bulk water supply. Now regulates flows along Gold Creek for irrigation. | 1885 | Good to Excellent |

## 5.2 Weirs

The main details of our weirs are shown in Table 5-2.

**Table 5-2 Weirs**

| Catchment | Name | Storage Capacity (ML) | Type | Purpose |
|---|---|---|---|---|
| Logan / Albert Rivers | Bromelton Weir | 390 | Sheet piling | Ponds water for riparian irrigation |
| | South Maclean Weir | 153 | Concrete gravity | Water Supply for communities in north Beaudesert |
| | Cedar Grove Weir | 1139 | Sheet piling | Bulk water supply |
| Warrill Valley | Upper Warrill Diversion Weir | 3 | Concrete and earth fill | Ponds water for Upper Warrill Gravity Diversion |
| | Kents Lagoon Diversion Weir | 5 | Earth and rock fill | Ponds water for Kents Lagoon Gravity Diversion |
| | Aratula Weir | 54 | Concrete gravity | Ponds water for riparian irrigation |
| | Warroolaba Creek Diversion Weir | 8 | Rock fill | Ponds water for Warroolaba Creek and Black Gully Gravity Diversions |
| | West Branch Warrill Diversion Weir | 2 | Earth fill | Ponds water for West Branch Warrill Gravity Diversion |
| | Warrill Creek Diversion Weir (Junction Weir) | 110 | Sheet piling | Ponds water for riparian irrigation |
| | Churchbank Weir | 170 | Concrete gravity | Ponds water for riparian irrigation |
| | Railway Weir | 20 | - | Ponds water for riparian irrigation |
| Lockyer Valley (Lower Lockyer) | Buaraba Creek Diversion Weir | 74 | Sheet piling | Diversion weir for filling Atkinson Dam via Buaraba Creek Diversion Channel |
| | Brightview Weir | 390 | Concrete gravity | Ponds water for riparian irrigation |
| | Sippels Weir | 25 | Concrete gravity | Ponds water for riparian irrigation |
| | Potters Weir | 30 | Concrete gravity | Ponds water for riparian irrigation |
| | O'Reillys Weir | 610 | Concrete gravity | Ponds water for riparian irrigation |

| Catchment | Name | Storage Capacity (ML) | Type | Purpose |
|---|---|---|---|---|
| Lockyer Valley (Central Lockyer Scheme) | Jordan I Weir | 450 | Concrete gravity | Pond water in Lockyer Creek to feed cross-connection to the Jordan II weir on the Redbank Creek. |
| | Jordan II Weir | 30 | Earth fill | Pump pool for the Redbank Creek PS for supplying Clarendon Dam. |
| | Wilson Weir (Gatton College Weir) | 230 | Concrete gravity | Ponds water for riparian irrigation |
| | Clarendon Weir | 230 | Sheet piling | Groundwater recharge |
| | Glenore Grove Weir | 330 | Sheet piling | Groundwater recharge |
| | Kentville Weir | 480 | Sheet piling | Groundwater recharge |
| | Laidley Creek Diversion Weir | 44 | Sheet piling | Pond water in Laidley Creek for diversion into Bill Gunn Dam, and for groundwater recharge |
| | Showgrounds Weir | 24 | Sheet piling | Pond water in Laidley Creek for groundwater recharge |
| | Crowley Vale Weir | 8 | Concrete gravity | Pond water in Laidley Creek as pumping pool for an off-stream storage owned by the Crowley Vale Water Board |
| | Lower Flagstone Creek Weir | 20 | Sheet piling | Groundwater recharge |
| | Flagstone Creek Weir | 94 | Sheet piling | Groundwater recharge |
| | Mulgowie Weir | 14 | Sheet piling | Groundwater recharge |
| | Gatton Weir | 130 | Sheet piling | Groundwater recharge |
| | Grantham Weir | 150 | Sheet piling | Groundwater recharge |
| | Carpendale Weir | 110 | Sheet piling | Groundwater recharge |
| | Ma Ma Creek Weir | 86 | Concrete gravity | Groundwater recharge |
| | Redbank Creek Weir | 18 | Sheet piling | Groundwater recharge |
| | Sandy Creek Weir | 19 | Sheet piling | Groundwater recharge |
| | Lower Tenthill Weir | 70 | Sheet piling | Groundwater recharge |
| | Tenthill Creek Weir | 15 | Sheet piling | Groundwater recharge |

| Catchment | Name | Storage Capacity (ML) | Type | Purpose |
|---|---|---|---|---|
| Upper Brisbane | Mt Crosby Weir | 3430 | Concrete gravity | Raw water balancing pool for Mt Crosby East Bank WTP and Mt Crosby West Bank WTP |
| Stanley River | Stanley River Weir (Woodford WTP) | 68 | Concrete gravity | Water Supply for township of Woodford |
| | Kilcoy Creek Weir | 185 | Concrete gravity | |
| Mary Valley | Maleny Weir | 66 | - | Bulk water supply |
| | Imbil Weir | 46 | Concrete gravity | Flow regulation |
| | Yabba Creek Weir | 8 | - | Bulk water supply |
| | Obi Obi Creek Weir (Weir No. 1) | - | - | Bulk water supply |
| Maroochy River | South Maroochy (Maroochy River) Intake Weir | 76 | Concrete gravity | Run of river stream flows in the South Maroochy River and releases from Cooloolabin Dam are diverted to Poona Dam from the intake Weir through a 450mm diameter steel gravity pipeline |
| Caboolture River | Caboolture River Intake & Weir | 820 | Concrete gravity | Supply town water for Caboolture Shire |
| | Waraba Creek Weir | 182 | Concrete gravity | Formerly used for bulk water supply for local townships |
| North Pine River | Dayboro Road Pump Station Weir | - | - | Bulk water supply |

## 5.3 Other Water Sources

Seqwater also owns:

- A further significant off-stream storage at Moodlu Creek Quarry[30];
- Three minor off-stream storages: Woodford Off-Stream Storage, Kilcoy Off-Stream Storage and Bigfoot Lagoon (adjacent to the Kooralbyn WTP);
- A minor structure to form the Seven Mile Lagoon in the Lockyer Valley;
- A river intake structure on the Mary River (to supply the Noosa WTP situated at Lake McDonald) and another on the Brisbane River at Lowood;
- Borefields around the Brisbane Aquifer treatment plants, on North Stradbroke and Bribie Islands and other bores at Dayboro WTP, Linville WTP, Kenilworth WTP and Atkinson Dam WTP.

## 5.4 Pump Stations

The main details of our pump stations are shown in Table 5-3.

**Table 5-3 Pump Stations**

| Catchment | Name | Pump Configuration | Flow | Source and Delivery Point |
|---|---|---|---|---|
| Nerang River | Hinze Dam Main Pump Station | 1 x 1100 kW, 2 x 680 kW + diesel motor | - | Hinze Dam to the break of head tank that feeds Molendinar WTP by gravity |
| | Hinze Dam Upper Intake Tower Pump Station | 1 x 750 kW, 2 x 500 kW | 77 ML/d | Hinze Dam to Mudgeeraba WTP |
| Logan / Albert Rivers | Canungra WTP Raw Water Intake Pump Station | - | - | Canungra Creek to Canungra WTP |
| | Beaudesert Logan River Intake Pump Station | 2 submersible pumps 2 x 45 kW | - | Logan River to Beaudesert WTP |
| | Kooralbyn Logan Intake Pump Station | 2 submersible pumps 2 x 75 kW | - | Logan River or Big Foot Lagoon to Kooralbyn WTP |
| | Rathdowney WTP Intake Pump Station | 2 x 5 kW | - | Logan River to Rathdowney WTP |
| | South Maclean Logan Intake Pump Station | 2 x 93 kW | 5.8 ML/d | Logan River to South Maclean WTP |

[30] The capacity to full supply level is 1,945 ML.

| Catchment | Name | Pump Configuration | Flow | Source and Delivery Point |
|---|---|---|---|---|
| Warrill Valley | Reynolds Creek Raw Water Pump Station | - | 45 L/s | Gough's Crossing to Boonah-Kalbar WTP |
| | Purdons Bridge Intake Water Pump Station | - | 30 L/s | Warrill Creek to Boonah-Kalbar WTP |
| Lockyer Valley | Clarendon Pump Station | 1 x 150 kW | - | Clarendon Dam to the Jordan II weir via the Clarendon Diversion channel (release from the dam to the Lockyer Creek) |
| | Redbank Creek Pump Station | 3 x 220 kW | - | Redbank Creek to Clarendon Dam via the Clarendon Diversion Channel (diverts water from the Redbank and Lockyer Creeks into the Clarendon Dam) |
| | Atkinson Dam Pump Station | 2 x 75 kW | - | Atkinson Dam to Brightview Channel (for release to local irrigation and Lockyer Creek) when dam storage is low |
| Upper Brisbane River | Mt Crosby East Bank WTP Raw Water Pump Station | 8 wells with 2 pumps each, 12 x 900 kW + 2 x 1750 kW + 2 x 1680 kW; | 988 ML/d (nominal maximum) | Brisbane River to East Bank WTP |
| | Mt Crosby West Bank WTP Raw Water Pump Station | 3 x 660 kW | 1,000 ML/d (nominal maximum) | Brisbane River to West Bank WTP |
| | Lowood WTP River Pump Station (Wet Well Component) | 2 x 150kW (wet well) 1 x 220 kW (dry well) | 220 L/s (wet well) 260 L/s (dry well) | Brisbane River to Lowood WTP |
| | Lowood WTP Raw Water Booster Pump Station | 2 x 220kW, 1 x 355kW | - | Brisbane River to Lowood WTP |
| | Wivenhoe Dam Raw Water Pump Station (Esk) | 2 x raw water pumps | 35 L/s each Pump | Lake Wivenhoe to Esk WTP |
| Stanley River | Stanley River Pump Station | 2 submersible pumps | 45 L/s | Stanley River Weir to Woodford WTP |
| | Woodford Off-stream Storage Pump Station | - | - | Woodford Off Stream Storage to Woodford WTP |
| | Somerset Dam Raw Water Pump Station | 2 x 18.5 kW | 7.8 L/s (Pump 1); 5.6 L/s (Pump 2) | Lake Somerset to Somerset Dam Township WTP |

| Catchment | Name | Pump Configuration | Flow | Source and Delivery Point |
|---|---|---|---|---|
| | Kilcoy Creek Off-stream Storage Water Pump Station | - | 110 L/s | Kilcoy Off-Stream Storage to Kilcoy WTP |
| | Kilcoy Creek Water Pump Station | 2 pumps | 36 L/s | Kilcoy Creek Weir to Kilcoy WTP |
| | Somerset Dam Water Pump Station | 72hp | 23 L/s | Lake Somerset to Kilcoy (Lake Somerset) WTP |
| Mary Valley | Pie Creek Pump Station | 2 x 112 kW | 27 ML/d | - |
| | Jimna Pump Station | - | 2.4 L/s | Yabba Creek Weir to Jimna WTP |
| | Mary River Pump Station | 2 x 800kW | 27 ML/d | Mary River to Cooroora Reservoir (break of head tank), which feeds Noosa WTP by gravity |
| | Lake MacDonald Intake & Raw Water Pump Station | 2 x 55 kW, 1 x 47 kW, 1 x 37 kW | 47 ML/d | Lake Macdonald Dam to Noosa WTP |
| | Maleny Raw Water Pumping Station | 2 pumps | - | Maleny Weir to Maleny WTP |
| | Kenilworth River WPS | A single submersible pump | 5.9 L/s | Kenilworth River Well to Kenilworth WTP |
| Maroochy River | Wappa Dam Lift Pump Station | Pump 2 and Pump 3 each have a capacity of 130 L/s | 180 L/s (parallel) | Wappa Dam to Image Flat WTP |
| Bribie Island Groundwater | Bribie Island Pump Station | 3 pumps | 96 L/s | Seepage trench to Bribie Island WTP |
| Caboolture River | Caboolture River Intake | 2 submersible pumps | 180 L/s | Caboolture River to Caboolture WTP |
| | Waraba Creek Pump Station | - | 10.4 ML/d | Waraba Creek to Moodlu Quarry Off-Stream Storage |
| | Moodlu Quarry Pump Station | - | 15 ML/d | Moodlu Quarry Off-Stream Storage to Waraba Creek |
| North Pine River | North Pine WTP Raw Water Pump Station | 6 pumps x 149 kW | 380 ML/d | North Pine Dam to North Pine WTP |
| | Dayboro Rd Raw Water PS | 6 pumps: 2 x 132 kW + 1 x 220 kW+ 1 x 75+ 2 x 300kW | 95.5 ML/d | Sideling Creek Dam (Lake Kurwongbah) and North Pine River to Petrie WTP |

| Catchment | Name | Pump Configuration | Flow | Source and Delivery Point |
|---|---|---|---|---|
| | Dayboro WTP Intake | - | 2 x 11 L/s (Well 1) 2 x 15 L/s (Well 2) | Dayboro borefield to Dayboro WTP |
| North Stradbroke Island Groundwater | Herring Lagoon Pump Station | 2 x 450 kW | 30.1 ML/d | Herring Lagoon to North Stradbroke Island WTP |
| Tingalpa Creek | Capalaba WTP Low Lift Pump Station | 2 x 150 kW, 2 x 60 hp pumps and a vacuum system | 10,13,13,45, 53 ML/d (five separate pumps) | Leslie Harrison Dam to Capalaba WTP |

## 5.5 Pipelines

Not all of the asset details for pipelines are known. The main details are shown in Table 5-4 for those pipelines where there is good information.

**Table 5-4 Pipelines**

| Catchment | Name | Description | Comment |
|---|---|---|---|
| Nerang River | Hinze Dam Upper Intake to Mudgeeraba WTP Raw Watermain | 3.3 km of 750 mm MSCL[31] | - |
| | Hinze Dam Lower Intake to Molendinar WTP Raw Watermain | 9.4 km of 1440 mm MSCL; 2.4 km of 1290 mm MSCL | There is one aerial crossing |
| | Little Nerang Dam to Mudgeeraba WTP Raw Water Main | 10.7 km of 860 mm MSCL | 2.25 km is buried; the remainder is above ground. |
| Logan / Albert Rivers | Rathdowney Raw Water Pipeline | 145 m of 100 mm AC | - |
| | South Maclean Raw Water Pipeline | 390 m of 300mm DI | - |
| | Beaudesert Raw Water Pipeline | 1400 m of 300mm AC | - |
| | Kooralbyn Raw Water Pipelines | 5 km of 225mm AC; 5 km of 150mm AC; 3km of 250 mm AC | - |
| Lockyer Valley (Central Lockyer) | Morton Vale Pipeline System | 15.5 km of various diameters | Local irrigation supply |

[31] MSCL = Cement lined mild steel, AC = Asbestos cement, DI = Ductile iron

| Catchment | Name | Description | Comment |
|---|---|---|---|
| | Lake Dyer Diversion Pipeline | 3.6 km of 1500 mm | Diverts flow from the Laidley Creek into Bill Gunn Dam |
| | Lake Dyer Diversion Pipeline Branch | 440 m of 1050 mm | Releases flow from Bill Gunn Dam back into the Laidley Creek |
| Lockyer Valley (Lower Lockyer) | Buaraba Creek Supply Pipeline | 1.95 km of 600 mm | Release water from Atkinson Dam to Buaraba Creek and local irrigation supply |
| Upper Brisbane River | Esk WTP Rising Main | 904 m of 200mm DI | - |
| | Somerset Dam WTP Rising Main | 250 m of 100mm (various materials) | - |
| Mary Valley | Blackall Range Tunnel | The 2.5 km long 3m wide Blackall Range Tunnel carries the 1086 mm MSCL pipeline | The tunnel has experienced minor rockfalls |
| | Noosa Raw Water Pipeline | 21.5km of 500 mm and 600 mm MSCL | - |
| Maroochy River | Maroochy Raw Water Mains | 3.0km of 600mm; 3.5km of 600 mm and 450 mm; 3.45 km 450 mm and 375 mm (all MSCL) | All fed by gravity except for the intake from Wappa PS |
| Caboolture River | Moodlu Quarry Transfer Pipeline | 1.76 km of 300mm DI | Transfer water to and from the Moodlu Quarry Off-StreamStorage |
| North Pine River | Pine River Raw Water Mains | 2.25km of 560 mm MSCL and 675 mm MSCL twin pipelines | The dual pipeline has some redundancy |
| North Stradbroke Island Groundwater | Herring Lagoon to North Stradbroke Island WTP Rising Main | 600 mm MSCL | - |
| Brisbane Groundwater | Brisbane Aquifers Rising Mains | 23km of uPVC | - |
| | Bulk Reticulation Mains | 181 m | - |
| | Bulk Trunk Mains | 12.2km | - |
| Lower Brisbane River | Gold Creek Dam to Enoggera Dam | 19.8km of 450mm | - |

## 5.6 Water Treatment Plants

The water treatment plant capacities are shown in Figure 5-2, and main details of our treatment plants are shown in Table 5-5.

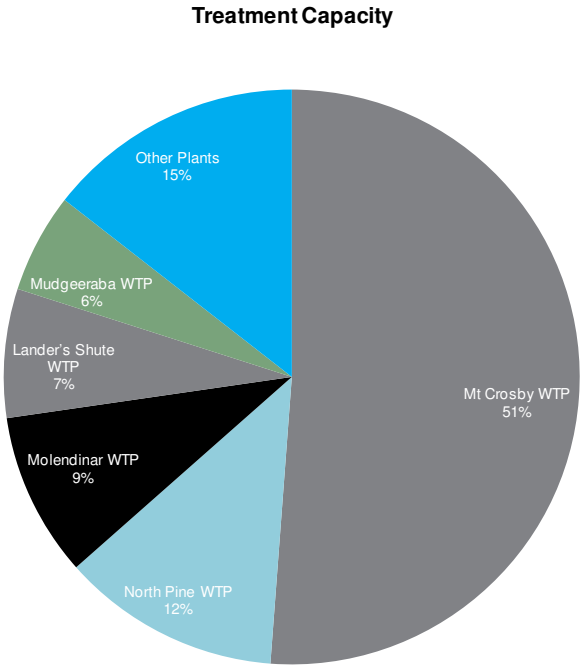


**Figure 5-2 Water Treatment Plant Capacities**

The details in Table 5.5 are yet to be verified, and this information will be updated in subsequent versions of the SAMP to reflect new assessments.

In particular, Seqwater is still proving the capacity[32] of each plant and the capacity figures may be revised over time as Seqwater better understands the capability of its assets and once the Water Grid Manager and Seqwater finalise their Drinking Water Quality Management Plans and risk management strategies as required by the Market Rules.

The capacity stated assumes good raw water conditions, and cannot be taken as an all year around, all condition capacity of the WTP, and therefore it cannot be used to assume annual or monthly production values. Given the high level of variability of the treatment train across the WTPs and raw water conditions such as blue green algae, toxins, turbidity, this is to be expected.

In several instances current manning arrangements limit the available capacity.

[32] For a number of reasons the capacity quoted is often less than the notional design peak capacity of the plant. Some units within the plant may perform poorly, or may be undersized relative to the remainder of the plant. For plants drawing water from borefields, the bore yield may be less than expected for a variety of reasons.

**Table 5-5 Water Treatment Plants**

| Catchment | WTP Name | Type | Capacity[33] | Installation Year | Condition[34] |
|---|---|---|---|---|---|
| Nerang River | Molendinar WTP | Clarification, filtration & disinfection | 165 ML/d | 1983 | Fair to Good |
| | Mudgeeraba WTP | Clarification, filtration & disinfection | 100 ML/d | 1967 | Fair to Good |
| | Hinze Dam WTP | Clarification, filtration & disinfection (package plant) | 86 kL/day | - | - |
| Logan / Albert Rivers | Beaudesert WTP | Clarification, filtration & disinfection | 4.8 ML/d | 1986 | Fair to Good |
| | Canungra WTP | Clarification, filtration & disinfection | 0.6 ML/d | - | Fair to Good |
| | Kooralbyn WTP | Clarification, filtration & disinfection | 1.9 ML/d | - | Fair to Good |
| | Rathdowney WTP | Clarification, filtration & disinfection | 0.4 ML/d | - | Fair to Good |
| | South Maclean WTP | Clarification, filtration & disinfection | 11 ML/d | 1993 (Stage 1)<br>2003 (Stage 2) | Fair to Good |
| | Maroon Dam WTP | Filtration & disinfection (package plant) | 100 kL/d | 2006 | New |
| Warrill Valley | Boonah-Kalbar WTP | Clarification, filtration & disinfection | 3.5 ML/d | 1985 (some facilities date to 1960s) | Fair |
| | Moogerah Dam WTP | Clarification, filtration & disinfection (package plant) | 90 kL/day | 2006 | New |
| | Aratula WTP | - (package plant) | - | - | - |
| Lockyer Valley | Atkinson Dam (Recreation) WTP | Disinfection only | - | - | - |

[33] Refer footnote 32 and observations made in the main text.

[34] The condition descriptions shown in this table are based on the condition assessments compiled during the Technical Due Diligence project for Queensland Treasury prior to the formation of Seqwater. Where more than one description is given, it refers to different components of the plant. Some renewals work has been undertaken since the condition assessments used in this table were made.

| Catchment | WTP Name | Type | Capacity[33] | Installation Year | Condition[34] |
|---|---|---|---|---|---|
| Upper Brisbane River | Mt Crosby East Bank WTP | Clarification, filtration & disinfection; Chloramination at clear water storage | 916 ML/d | First use of site in 1892 | Fair to Good |
| | Mt Crosby West Bank WTP | Clarification, filtration(DAF) & disinfection; Chloramination at clear water storage | | 1986 | Fair to Good |
| | Lowood WTP | Clarification, filtration & disinfection | 20 ML/d | 1989 | Good |
| | Linville WTP | Disinfection only | 0.45 ML/d | 1982 | Poor (electrical), otherwise good |
| | Esk WTP | Clarification, filtration & disinfection | 0.8 ML/d | 2000[35] | Fair to Good |
| | Wivenhoe Dam (Recreation) WTP | - (package plant) | - | - | - |
| Stanley | Woodford WTP | Clarification, filtration & disinfection | 3.2 ML/d | 1966 | Fair to Good |
| | Somerset Dam Township WTP | Clarification, filtration & disinfection | 0.5 ML/d | | Fair to Good |
| | Kilcoy WTP | Clarification, filtration & disinfection | 1.5 ML/d | 1967 | Poor (mechanical and electrical), Fair (civil and structural) |
| | Kilcoy (Lake Somerset) WTP | Filtration & disinfection | - | - | Fair to Good |
| | Kirkleagh (Recreation) WTP | Filtration & disinfection | - | - | - |
| Mary Valley | Landers Shute WTP | Clarification, filtration, ozone / BAC & disinfection | 130 ML/d | 1989 | Good to Excellent |

[35] The first Esk WTP was built in 1981 but only the reservoir remains from the original plant.

| Catchment | WTP Name | Type | Capacity[33] | Installation Year | Condition[34] |
|---|---|---|---|---|---|
| | Maleny WTP | Clarification, filtration & disinfection | 2.2 ML/d | 1989 | Good |
| | Kenilworth WTP | Filtration & disinfection | 0.36 ML/d | 1958 | Poor (some electrical), Fair (mechanical and rest of electrical), Good (civil and structural) |
| | Borumba Dam WTP | - (package plant) | 20 kL/d | 2006 | New |
| | Noosa WTP | Clarification, filtration, ozone / BAC & disinfection | 30 ML/d | 1968 | Fair (civil and structural), Good (mechanical), Excellent (electrical) |
| | Jimna WTP | Filtration and Disinfection | 0.1 ML /d | 1960s | Poor to Fair |
| Maroochy | Image Flat WTP | Clarification, filtration & disinfection | 18 ML/d | 1968 (Stage 1)<br>1975 (Stage 2) | Fair to Good |
| Mooloolah | Ewen Maddock WTP | Clarification, filtration, ozone / BAC & disinfection | 20 ML/d | 2009 | New |
| Bribie Island Groundwater | Banksia Beach WTP | - | 3.6 ML/d | 2008 | New |
| | Woorim WTP | Clarification, filtration & disinfection | 3.6 ML/d | 1972 | Poor (Mechanical & Electrical ), Fair (Civil) |
| Caboolture | Caboolture WTP | Clarification(DAF), filtration & disinfection | 14 ML/d | 1974 | Good |
| North Pine | North Pine WTP | Clarification, filtration & disinfection | 220 ML/d | 1976 | Good |

| Catchment | WTP Name | Type | Capacity[33] | Installation Year | Condition[34] |
|---|---|---|---|---|---|
| | Dayboro WTP | Clarification, filtration (greensand) & disinfection | 1.1 ML/d | 1958 (Stage 1)<br>1977 (Stage 2)<br>1988 (Stage 3) | Good |
| | Petrie WTP | Clarification, filtration & disinfection | 45 ML/d | 1960 | Fair to Good |
| North Stradbroke Island Groundwater | Amity Point WTP | pH correction & disinfection | 0.5 ML/d | 1984 | Fair |
| | Dunwich WTP | pH Correction, filtration & disinfection | 1.0 ML/d | 1981 | Fair |
| | North Stradbroke Island WTP[36] (Borefield) | Disinfection only | 26 ML/d | 1996 | Fair |
| | North Stradbroke Island (Herring Lagoon) | Clarification (DAF), filtration & disinfection | | 1990[37] | Fair |
| | Point Lookout WTP | pH Correction & Disinfection | 1.7 ML/d | 1972 | Fair |
| Tingalpa Creek | Capalaba WTP | Clarification, filtration & disinfection | 18 ML/d | 1968 (Stage 1)<br>1994 (Stage 2) | Fair to Good |
| Brisbane Groundwater | Algester WTP | Aeration, filtration & disinfection | 1.9 ML/d | 2007 | New |
| | Chandler WTP | Aeration, filtration & disinfection | 4.8 ML/d | 2007 | New |
| | Forest Lake WTP | Aeration, filtration & disinfection | 1.7 ML/d | 2007 | New |
| | Runcorn WTP | Aeration, filtration & disinfection | 10 ML/d | 2007 | New |
| | Sunnybank WTP | Aeration, filtration & disinfection | 2.9 ML/d | 2007 | New |

[36] There are two different treatment processes on the same site at North Stradbroke Island WTP for the two different sources. For clarity, they are listed separately here.
[37] However part of the plant was the rebuilt following the fire in 2004.

| Catchment | WTP Name | Type | Capacity[33] | Installation Year | Condition[34] |
|---|---|---|---|---|---|
| Lower Brisbane | Enoggera WTP | Flocculation, DAF, filtration & disinfection | 3.25 ML/d | First use of site in 1863 | Currently being refurbished |

## 5.7 Reservoirs

The main details of our reservoirs are shown in Table 5-6.

**Table 5-6 Reservoirs**

| Catchment | Reservoir Name | Size | Structure Type | Roof (Material) |
|---|---|---|---|---|
| Nerang River | Mudgeeraba WTP Break of Head Tank | - | Concrete / Ground | - |
| | Mudgeeraba WTP Clearwater Reservoir 1 | 1.38 ML | Concrete / Ground | Concrete |
| | Mudgeeraba WTP Clear water Reservoir 2 | 6.60 ML | Concrete / Ground | Metal |
| | Molendinar Reservoir 3 | 9.09 ML | Concrete / Ground | Metal |
| | Molendinar Reservoir 4 | 30 ML | Concrete / Ground | Metal |
| | Molendinar Reservoir 5 | 30 ML | Concrete / Ground | Metal |
| | Molendinar Reservoir 6 | 30 ML | Concrete / Ground | Metal |
| Logan / Albert Rivers | Canungra WTP Clearwater Storage 1 | 19 kL | Metal / Ground | Metal |
| | Beaudesert WTP Clearwater Reservoir 1 | 0.5 ML | Concrete / Ground | - |
| | Kooralbyn WTP Clearwater Storage 1 | 1.5 ML | Concrete / Ground | Metal |
| | Rathdowney WTP Clearwater Storage 1 | 50 kL | GRP[38] / Ground | Metal |
| | South Maclean WTP Clearwater Storage 1 | 0.675 ML | Concrete / Ground | Sheet |
| | South Maclean WTP Clearwater Storage 2 | 0.675 ML | Concrete / Ground | Sheet |
| | Maroon Dam WTP Raw Water Tank | 23.6 kL | GRP / Ground | GRP |
| | Maroon Dam WTP Treated Water Tanks (3 tanks) | 66 kL | GRP / Ground | GRP |
| | Cedar Grove WTP Clear Water Reservoir 1 | 0.6 ML | - | - |
| Warrill Valley | Boonah-Kalbar WTP Clearwater Reservoir | 0.455 ML | Concrete / Ground | Metal |

[38] Glass reinforced plastic

| Catchment | Reservoir Name | Size | Structure Type | Roof (Material) |
|---|---|---|---|---|
| | Moogerah Dam WTP Raw Water Tank | 22.5 kL | GRP / Ground | GRP |
| Lockyer Valley | Atkinson Dam (Recreation) WTP Header tank | 450 kL | - | - |
| Upper Brisbane River | Mt Crosby East Bank WTP Clear Water Tank 1 | 4.8 ML | Under Ground | - |
| | Mt Crosby East Bank WTP Clear Water Tank 2 | 3.8 ML | Under Ground | - |
| | Mt Crosby East Bank WTP High Level Reservoir | 11.6 ML | Concrete / Ground | Floating polypropylene |
| | Mt Crosby West Bank WTP Clear Water Wet Well | 3.6 ML | Under Ground | - |
| | Cameron's Hill Reservoir 1 (Stand alone) | 80 ML | Concrete / Ground | Concrete |
| | Cameron's Hill Reservoir 2 (Stand alone) | 85 ML | Concrete / Ground | Metal |
| | Lowood WTP Clearwater Storage 1 | 3.0 ML | Concrete / Ground | Metal |
| | Linville WTP Clearwater Storage Tank | 0.1 ML | Concrete / Ground | - |
| | Esk WTP Clearwater Storage 1 | 1.12 ML | Concrete / Ground | AC |
| | Toogoolawah Reservoir #1 | - | Concrete / Ground | Metal |
| Stanley | Woodford WTP Clearwater Storage 1 | 1.4 ML | Concrete / Ground | Metal |
| | Woodford WTP Clearwater Storage 2 | 340 kL | Concrete / Ground | Metal |
| | Somerset Dam WTP Clearwater Storage 1 | 0.5 ML | Concrete / Ground | Concrete |
| | Kilcoy WTP Clear water Reservoir | 683 kL | Concrete / Ground | Metal |
| | Lake Somerset WTP Clear water Reservoir | 90 kL | Concrete / Ground | Concrete |
| Mary Valley | Landers Shute WTP Clear Water Reservoir 1 | 11 ML | Concrete / Ground | Metal |
| | Landers Shute WTP Clear Water Reservoir 2 | 9 ML | Concrete / Ground | Metal |
| | Maleny WTP Clearwater Storage 1 | 0.4 ML | Concrete / Ground | Metal |
| | Jimna WTP Clear water Storage 1 | 90 kL | Concrete / Ground | Metal |

| Catchment | Reservoir Name | Size | Structure Type | Roof (Material) |
|---|---|---|---|---|
| | Kenilworth WTP Clearwater Storage 1 | 20 kL | Concrete / Ground | Concrete |
| | Noosa WTP Clearwater Reservoir | 5.6 ML | Concrete / Ground | AC |
| | Cooroora Reservoir (Raw) | 5ML | Concrete / Ground | Metal |
| | Borumba Dam WTP Raw Water Tank 1 | 9 kL | GRP / Ground | - |
| | Borumba Dam WTP Raw Water Tank 2 | 5 kL | GRP / Ground | - |
| | Borumba Dam WTP Treated Water Tanks (2 tanks) | 44 kL | GRP / Ground | - |
| | Upper Reservoir downstream of the Jimna WTP | - | Concrete / Ground | Metal |
| Maroochy | Image Flat WTP Clearwater Storage 1 | 1.14 ML | Concrete / Ground | Concrete |
| | Image Flat WTP Clearwater Storage 2 | 4.55 ML | Concrete / Ground | Concrete |
| Bribie Island Groundwater | Woorim WTP Clearwater Storage 1 | 9 ML | Concrete / Ground | Metal |
| Caboolture | Caboolture WTP Clearwater Storage 1 | 9.1 ML | Concrete / Ground | Metal |
| North Pine | North Pine WTP Elevated Reservoir | 0.9 ML | Concrete / Ground | Concrete |
| | North Pine WTP Pure Water Reservoir 1 | 45 ML | Concrete (buried underground) | - |
| | North Pine WTP Pure Water Reservoir 2 | 45 ML | Concrete (buried underground) | - |
| | Petrie WTP Clearwater Storage 1 | 8.3 ML | Concrete / Ground | AC |
| | Petrie WTP Clearwater Storage 2 | 8.9 ML | Concrete / Ground | AC |
| North Stradbroke Island Groundwater | Amity Point WTP Clearwater Storage 1 | 42.5 kL | Concrete / Ground | Concrete |
| | Dunwich WTP Clearwater Storage 1 | 150 kL | Concrete / Ground | Concrete |
| | North Stradbroke Island WTP Clearwater Storage 1 - Bore Field | 4 ML | Concrete / Ground | Metal |
| | North Stradbroke Island WTP Clearwater Storage 2 – Herring Lagoon | 4 ML | Concrete / Ground | Metal |

| Catchment | Reservoir Name | Size | Structure Type | Roof (Material) |
|---|---|---|---|---|
| | Pt Lookout WTP Clearwater Storage 1 | 1.5 ML | Concrete / Ground | Concrete |
| Tingalpa Creek | Capalaba WTP Clearwater Storage 1 | 4.5 ML | Concrete / Ground | Metal |
| | Capalaba WTP Clearwater Storage 2 | 4.5 ML | Concrete / Ground | Metal |
| Lower Brisbane | Enoggera WTP Clear Water Storage 1 | 3.6 ML | Under Ground | - |
| Brisbane Groundwater | Calamvale/Algester Aquifer Treated Water Storage | - | Steel / Ground | Metal |
| | Chandler Aquifer Treated Water Storage | - | Steel / Ground | Metal |
| | Forest Lake Aquifer Treated Water Storage | - | Steel / Ground | Metal |
| | Runcorn Aquifer Treated Water Storage | - | Steel / Ground | Metal |
| | Sunnybank Aquifer Treated Water Storage | - | Steel / Ground | Metal |

## 5.8 Irrigation Channels

The detail of the main irrigation channels are provided in Table 5-7.

**Table 5-7 Irrigation Channels**

| Catchment | Facility | Function | Length / Diameter |
|---|---|---|---|
| Lockyer Valley (Central Lockyer) | Clarendon Diversion Channel | 2-way channel serving as both an inlet and outlet from Clarendon Dam. | 6.5 km |
| Lockyer Valley (Lower Lockyer) | Buaraba Creek Diversion Channel | Divert flows to Atkinson Dam from Buaraba Creek | 1.1 km[39] |
| | Seven Mile Lagoon Diversion Channel | Deliver water from Seven Mile Lagoon to Atkinson Dam | 1.35 km |
| | Buaraba Creek Supply Channel | Release water from Atkinson Dam to Buaraba Creek and local irrigation supply (natural) | 900m[40] |
| | Brightview Channel | Release water from Atkinson Dam to Lockyer Creek and local irrigation supply | 2.4 km |
| | Brightview Channel (BR1) Lateral | Local irrigation supply | - |
| Mary Valley (Pie Creek Scheme) | Pie Creek Main Channel | Supply laterals and supplement McIntosh and Calico Creeks for irrigation supply | |
| | McIntosh Channel | Irrigation supply | - |
| | Calico Creek Channel | Irrigation supply | - |
| | Pie Creek Lateral 1 | Irrigation supply | - |
| | Pie Creek Lateral 2 | Irrigation supply | - |

The irrigation channels include regulating structures within and at the end of the channels that are not separately identified within this document.

There is also a short channel which allows water to flow from the Lockyer Creek to the Redbank Creek just upstream of the Jordan II weir, from where it can be pumped to the Clarendon Dam.

[39] This is an approximate measurement made by using Google Earth. Similar measurements made for other assets in the Atkinson Scheme are not entirely consistent with the figures given (which were derived from SunWater documentation).
[40] This is an approximate measurement made by using Google Earth.

# 6. ASSET PERFORMANCE STANDARDS

All the major facilities and schemes operated by Seqwater produce water that is covered by explicit contractual conditions.

The Market Rules state that Seqwater shall produce a Grid Service Provider Performance Standard, which will set out the service standards for Seqwater by 30 September 2009. Subsequently, the SEQWGM will produce a Water Grid Performance Standard. The Market Rules allow that the Performance Standards may be revised over time. Seqwater expects they will be revised as Seqwater, the SEQWGM and other grid participants better understand the capabilities of the assets.

Seqwater expects to undertake further consultation with the QWC over the content and details of the Asset Performance Standards. It is expected that versions of the standards in future years will be more precise than the September 2009 version.

Subsequent versions of the SAMP will reflect the content of the Grid Service Provider Performance Standard and the methodology by which it has been determined[41].

The current standards for bulk water supply are specified by the conditions of the Grid Contract with the Water Grid Manager. Seqwater has adopted the Grid Contract requirements as the current basis for asset performance, whilst acknowledging that this is a temporary measure.

**Table 6-1 Asset Performance Standards**

| Performance Standard | Bulk Water Supply & Treatment |
|---|---|
| Water Quality | The standards for water quality are specified in the Grid Contract with the Water Grid Manager. |
| Reliability | The requirements for reliability are set in the Grid Contract with the Water Grid Manager. |

The several standard irrigation contracts specify the conditions for the irrigation supply in a similar manner the Grid Contract does for bulk water supply.

[41] Subject to commercial and other regulatory considerations.

# 7. OPERATIONS AND MAINTENANCE

## 7.1 Operation of the Water Grid

The South East Queensland Water Grid allows for water to be transferred from areas where there is adequate water stored to areas where water sources are depleted. During acute stages of a drought, this mechanism may be used to supply water to areas where the local dams have low storage levels. The Water Grid also provides an opportunity to maximise the future storage potential across the region.

The Queensland Water Commission's System Operating Plan provides the overall context for the operation of the Water Grid. The rules for the operation of the Water Grid are set out in section 4 of the Market Rules.

Before each month, the different Grid Participants provide forecasts of their demand and capacity as appropriate.

Seqwater provides a Grid Service Provider Forecast Notice stating its water in storage and its expected treatment capacity[42]. LinkWater provides a forecast of its expected distribution capacity, as will the yet-to-be-formed region wide distribution entity. The Grid Customers provide forecasts of their demand. Once established, the future water retail companies will do the same. Currently, the various local government owned water service providers perform the functions of the future distribution and retail companies.

The Water Grid Manager then issues Grid Instructions to the various Grid Participants. For Seqwater, the Grid Instructions specify how much water should be produced from each water treatment plant. The Grid Participants have an opportunity to review and seek amendments to the Grid Instructions prior to the commencement of the period covered by the Grid Instruction.

The Market Rules provide that the production at any Seqwater facility should be within +/- 20% of the amount specified in the Grid Instructions.

Once the Grid Instruction takes effect the Grid Participants, including Seqwater, must comply with the Grid Instructions, except where compliance would result in certain undesirable outcomes (refer section 4.13(b) of the Market Rules). The Market Rules also provide a mechanism for excusing non-compliance in some circumstances, provided notification is provided to the SEQWGM of an 'Inability to Comply'. Such a notice is required irrespective of the driver for the supply being outside of the +/- 20% margin i.e. notice is required if forecast demand by the Water Grid Manager was outside of the actual final monthly demand, LinkWater makes operational decisions to source water from different Seqwater water treatment plants, there is poor raw water quality upstream of a Seqwater treatment plant which requires the plant to be taken off-line, or because unplanned maintenance must be undertaken on a treatment plant.

[42] The capacity figures listed in the Grid Service Provider Forecast Notice provided by Seqwater and other related reports may differ from the figures provided elsewhere in the SAMP for a number of reasons, such as asset maintenance or a need to comply with limits imposed in water allocations such as the Interim Resource Operating Licences.

The Market Rules also make provision for LinkWater and the Distribution Service Providers to provide Operating Instructions to Seqwater to give effect to the Grid Instructions. There are similar provisions for the amendment of Operating Instructions or for notifications where compliance with the Operating Instructions is not possible as there are for Grid Instructions. Operating protocols have been developed for each of the interface points between Seqwater and other Grid Participants.

In practice, the signals for water production requirements are relayed automatically through the links in the control systems shared with the local governments, or from signals to the plant control systems from levels in the clear water reservoirs, which are set by demand in the local government networks.

In many cases, the Grid Instructions from the Water Grid Manager specify that production should be 'as required to meet demand'. The Water Grid Manager has advised that this applies where there "is a direct connection to the customer's infrastructure and therefore systems demand".

## 7.2 Scheme Operations

In most cases Seqwater has few operational choices in what source and how much water to draw from to meet bulk water supply requirements. The production quotas for each treatment plant must meet local demand requirements within the constraints of the Grid Instructions, and there is often only one source that can supply the bulk supply points.

However, in some cases Seqwater does have some flexibility to draw water from more than one source:

- Mudgeeraba WTP can draw water from both Little Nerang Dam and Hinze Dam;
- North Stradbroke Island WTP can draw water from both Herring Lagoon and the local borefields;
- Petrie WTP can draw water from both Sideling Creek Dam (Lake Kurwongbah) and the North Pine River;
- Water can be released from either Lake Wivenhoe or Lake Manchester to supply the Brisbane River for treatment at the Mt Crosby plants[43];
- Image Flat WTP can draw water from Poona Dam or Wappa Dam, both of which are fed by Cooloolabin Dam and the South Maroochy River;
- Kilcoy WTP can draw water from either the Kilcoy Creek or the small off-stream storage adjacent to the plant; and
- Woodford WTP can draw water either from the Stanley River Weir or the adjacent off-stream storage.

Where there are dams in series (for example Somerset Dam discharges into Wivenhoe Dam, and Little Nerang dam discharges into Hinze Dam), as a general rule Seqwater

[43] However, the usual operational choice is to release water from Lake Wivenhoe. Lake Manchester was used to augment the Lake Wivenhoe supply during the drought, but the water from Lake Manchester has higher concentrations of iron and manganese, and it is now only used sparingly.

will seek to keep the higher of the two dams proportionately fuller to minimise evaporation from the smaller surface areas.

Where there is a choice to draw from a river source and a lake or off-stream storage, where water quality conditions allow, Seqwater will draw from the river.

Where there is the ability to draw water from alternative sources, the source can be chosen at the treatment plant. For the larger plants there is a remote or automatic capability to do so through the SCADA system.

In some cases, the existence of the Water Grid also provides the capability to switch demand to alternative plants in the event of major maintenance or water quality issues.

There is also some opportunity to provide local supplies through different treatment plants. For example, North Pine WTP can serve some parts of the Moreton Bay region usually served by Petrie WTP.

For off-stream storages, Seqwater will seek to maximise the capture of water. In some cases this must be balanced against avoiding the risk of overtopping during rainfall.

For the irrigation schemes, water releases are scheduled to meet orders made by farmers, taking into account water availability, allocations, transit times and channel capacity.

## 7.3 Dam Operations

As well as their normal water supply function, several of the Seqwater dams perform a significant flood mitigation function. Wivenhoe, Somerset and North Pine dams and Leslie Harrison dams all have spillway gates[44], which can be opened during heavy rainfall to allow water to be released from the spillway.

Under provisions now contained in the *Water Supply (Safety and Reliability) Act* 2008, Seqwater is required to maintain formal flood mitigation manuals for the first three dams, which stipulate the procedures that should be followed in the event of significant rainfall.

The Bureau of Meteorology (BOM), the former SEQWater and Brisbane City Council developed a sophisticated warning and control system for the Wivenhoe catchment, including Somerset Dam.

BOM operates an Australia wide Flood "ALERT" data collection system. In the Wivenhoe catchment the network consists of manual rainfall and river height observers as well as automated telemetry equipment. A computer model of the catchment is then used to predict the expected height of the water in the dam.

These predictions are then used to determine gate operations in order to ensure the structural safety of the dams and in order to minimise flooding downstream. Similar protocols are in place for North Pine Dam as for the Wivenhoe / Somerset system.

A flood control centre is manned during flood events to control gate operations at Wivenhoe, Somerset and North Pine dams. The control centre is now operated as a shared facility between Seqwater and SunWater.[45]

[44] There are also spillway gates at Little Nerang Dam, however they are not functional and are currently locked in the open position.
[45] The status of the facility is currently under review.

There are also procedures for operating the floodgates at Leslie Harrison Dam.

The Emergency Action Plans prepared for all Seqwater dams include communication protocols that must be followed in the event of a severe rainfall event that might lead to downstream flooding.

Seqwater also operates destratification systems at several dams, and undertakes catchment management operations to improve raw water quality.

## 7.4 Dam Safety

The DERM has issued Dam Safety Conditions for all 25 dams listed in Table 5-1. The details of these facilities are shown in Table 7-1.

**Table 7-1 Dam Safety Ratings**

| Catchment | Name | Maximum Population at Risk | Failure Impact Rating | Hazard Category (ANCOLD) |
|---|---|---|---|---|
| Nerang River | Hinze Dam | 120000 | 2 | Extreme |
| | Little Nerang Dam | 18 | 1 | High C |
| Logan / Albert Rivers | Bromelton Dam | 6 | 1 | High C |
| | Maroon Dam | 352 | 2 | High A |
| | Nindooninbah | 3 | 1 | High C |
| Warrill Valley | Moogerah Dam | 394 | 2 | High A |
| Lockyer Valley (Lower Lockyer) | Atkinson Dam | 47 | 1 | High C |
| Lockyer Valley (Central Lockyer) | Clarendon Dam | > 100 | 2 | High A |
| | Bill Gunn Dam | > 100 | 2 | High A |
| Upper Brisbane River | Wivenhoe Dam | 244000 | 2 | Extreme |
| | Lake Manchester Dam | 1273 | 2 | Extreme |
| Stanley River | Somerset Dam | > 1000 | 2 | Extreme |
| Mary Valley | Lake MacDonald Dam | 142 | 2 | High A |
| | Baroon Pocket Dam | 426 | 2 | High A |
| | Cedar Pocket Dam | < 100 | 1 | High C |
| | Borumba Dam | 365 | 2 | High A |
| Maroochy River | Cooloolabin Dam | 155 | 2 | High A |
| | Poona Dam | 6 | 1 | High C |
| | Wappa Dam | > 100 | 2 | High A |
| Mooloolah River | Ewen Maddock Dam | 1160 | 2 | Extreme |
| North Pine River | Sideling Creek Dam | 3948 | 2 | Extreme |
| | North Pine Dam | > 1000 | 2 | Extreme |
| Tingalpa Creek | Leslie Harrison Dam | 2400 | 2 | Extreme |

| Catchment | Name | Maximum Population at Risk | Failure Impact Rating | Hazard Category (ANCOLD) |
|---|---|---|---|---|
| Lower Brisbane River | Enoggera Dam | 2450 | 2 | Extreme |
| | Gold Creek Dam | 146 | 2 | High A |

Typical Dam Safety Condition requirements include the preparation of procedures, plans and documents relating to the following:

- Emergency Actions;
- Flood Operations;
- Standing Operating Procedures;
- Routine Inspection and Surveillance (including dam safety instrumentation data collection);
- Annual and Comprehensive (5 year) Inspection;
- Dam Safety Review and Risk Assessment;
- Operations and Maintenance.

These requirements must be completed in accordance with the Queensland Dam Safety Management Guidelines.

Many of the dams were audited by the DERM prior to the change of ownership of the dams on 1 July 2008 and many non-conformances with Dam Safety Conditions have been identified by the DERM. Seqwater is working closely with the DERM to rectify these non-conformances and has established a Dam Safety Group to manage this process.

## 7.5 WTP Operation and Control

The main operating functions at treatment plants include:

- Operation of pumps and valves to control the source of raw water (where applicable), the flow rate (where applicable), and how water and waste products are directed within the treatment plant;
- Monitoring of raw and treated water quality parameters;
- Alteration of chemical dosing rates in response to changes in flow rates, and raw and treated water parameters;
- Timing of backwash operations.

Seqwater has a range of control systems and manning arrangements for its plants.

Many of the larger plants have extensive automation. There is 24 hour control centre at Mt Crosby East Bank, where operators can remotely control Mt Crosby East Bank and West Bank and North Pine plants and to monitor the Brisbane Aquifer plants. Similarly, there is 24 hour monitoring of the Molendinar and Mudgeeraba plants via the service level arrangement with Gold Coast City Council.

Except for some of the smaller plants, there is provision for the plant to operate unattended, with the control system automatically notifying on-call operators in the event of faults. In many cases the operators also have the ability to remotely dial-in to make some changes in plant operations.

However some of the smaller plants have very limited automated process monitoring capability, and therefore faults may not be detected. At one plant there is currently no automation at all and all operations must be undertaken manually.

A summary of capabilities of the control systems and the provision for unattended operation is provided in Table 7-2 below.

**Table 7-2 WTP Operation**

| Catchment | Facility | Operation[46] |
|---|---|---|
| Nerang River | Molendinar WTP | The plant can operate automatically. Network staff monitor the site 24 hrs per day and contact on-call operators if necessary. Operators can remotely dial-in.<br>There is comprehensive on-line monitoring. |
| | Mudgeeraba WTP | The plant can operate automatically. Network staff monitor the site 24 hrs per day and contact on-call operators if necessary. Operators can remotely dial-in.<br>There is comprehensive on-line monitoring. |
| | Hinze Dam WTP | The Hinze Dam package plant is run as a batch plant. There is on-line analysis information which can be viewed from Molendinar WTP. |
| Logan / Albert | Kooralbyn WTP | The Kooralbyn, Canungra and Rathdowney treatment plants can operate automatically. There is also provision for monitoring and control from Beaudesert[47]. Operators can monitor and control some functions remotely from home. Operators are required manage a wide range of environmental conditions. |
| | Canungra WTP | |
| | Rathdowney WTP | |
| | Beaudesert WTP | Beaudesert WTP has a fully automated control system. Operators can monitor and control some functions remotely from home. Beaudesert provides as central control SCADA for the other Beaudesert treatment plants. |
| | South Maclean WTP | South Maclean WTP has a fully automated control system. Operators can monitor and control some functions remotely from home. |

[46] Seqwater is reviewing the control and monitoring arrangements across its facilities. A number of changes are likely to be made as Seqwater develops it SCADA strategies and finalises its Drinking Water Quality Management Plans.
[47] Beaudesert is shared with Scenic Rim Regional Council. Currently Rathdowney WTP and Kooralbyn WTP can only be viewed from the Scenic Rim Regional Council offices located there.

| Catchment | Facility | Operation[46] |
|---|---|---|
| | Maroon Dam WTP | The plant can operate automatically. Alarms send text messages to on-call operators to signal problems. Operators can remotely dial-in to operate the plant and acknowledge alarms.<br>There is on-line monitoring for power failure, high/low reservoir levels, pH, turbidity and chlorine. There is no on-line monitoring for pump failures. |
| Warrill Valley | Boonah-Kalbar WTP | The plant can operate automatically, however dosing and flow changes, and backwashing must be undertaken manually. Alarms send text messages to on-call operators to signal problems. Operators can remotely dial-in to change all pumps and valves.<br>There is on-line monitoring for reservoir levels, pump failures, power failure, raw and treated water turbidity. There is no on-line monitoring for pH or chlorine. |
| | Moogerah Dam WTP | The plant can operate automatically. Alarms send text messages to on-call operators to signal problems. Operators can remotely dial-in to operate the plant and acknowledge alarms.<br>There is on-line monitoring for power failure, high/low reservoir levels, pH, turbidity and chlorine. There is no on-line monitoring for pump failures. |
| | Aratula WTP | - |
| Lockyer Valley | Atkinson Dam (Recreation) WTP | - |
| Upper Brisbane | Lowood WTP[48] | The plant is manually operated. Alarms will trigger a call-out system to signal problems when the plant is not attended. Operators can remotely dial-in to start and stop pumps and to acknowledge alarms.<br>There is on-line monitoring for power failure, high/low reservoir levels, pH, raw water turbidity, chlorine and pump failures. |

[48] The plant is also known as Esk-Gatton-Laidley WTP.

| Catchment | Facility | Operation[46] |
|---|---|---|
| | Linville WTP | The plant is manually operated. The plant is visited weekly. Alarms will trigger a call-out system to signal problems when the plant is not attended. Operators can remotely dial-in to view to acknowledge alarms and the telemetry information can also be viewed from Esk. The plant cannot be remotely operated.<br>There is on-line monitoring for power failure and high/low reservoir levels. There is no on-line monitoring for pump failures, pH, turbidity or chlorine. |
| | Esk WTP | The plant is manually operated. Alarms will trigger a call-out system to signal problems when the plant is not attended. Operators can remotely dial-in to start and stop pumps and to acknowledge alarms.<br>There is on-line monitoring for power failure, high/low reservoir levels and pump failures. There is no on-line monitoring for pH, turbidity or chlorine. |
| | Mt Crosby East Bank WTP | East Bank has a comprehensive, automated control system. The East Bank control centre is used to remotely monitor and control the West Bank, North Pine, Enoggera and Brisbane Aquifer Plants after hours |
| | Mt Crosby West Bank WTP | West Bank has a comprehensive, automated control system. The plant is capable of 24 hour operation with remote control from East Bank after hours. |
| | Wivenhoe Dam (Recreation) WTP | - |
| Stanley River | Kilcoy WTP | The plant is manually operated. There is currently no on-line monitoring, but on-line monitoring is being installed for power failure, high/low reservoir levels, and pump failures. |
| | Kilcoy (Lake Somerset) WTP | The plant mostly operated manually. The facility requires additional instrumentation and controls to be operated automatically.<br>The plant is not operated regularly. |

| Catchment | Facility | Operation[46] |
|---|---|---|
| | Somerset Dam Township WTP | The plant is manually operated. Alarms will trigger a call-out system to signal problems when the plant is not attended. Operators can remotely dial-in to acknowledge alarms. The plant cannot be remotely operated.<br>There is on-line monitoring for power failure, high/low reservoir levels and pump failures. There is no on-line monitoring for pH, turbidity or chlorine. |
| | Kirkleagh (Recreation) WTP | - |
| | Woodford WTP | The plant is automatically operated. Alarms will trigger a call-out system to signal problems when the plant is not attended. There is a limited remote operation capability. |
| Mary Valley | Noosa WTP | The plant is automatically operated. Alarms will trigger a call-out system to signal problems when the plant is not attended. Operators can monitor and control the plant functions remotely after normal hours. |
| | Landers Shute WTP | Landers Shute has a comprehensive, automated control system. The plant is capable of 24 hour operation. Operators can monitor and control some functions remotely from home. |
| | Maleny WTP | The plant is automatically operated. The facility is monitored remotely from Caloundra and Maleny STP. The WTP generally operates unmanned. |
| | Jimna WTP | The plant is mostly unattended and mostly operated in manual. There is limited telemetry. |
| | Kenilworth WTP | The plant can operate automatically, and is monitored and operated by the operators at Image Flat WTP. |
| | Borumba Dam WTP | Borumba Dam WTP is run as a batch plant. There is limited on-line monitoring. |
| Maroochy River | Image Flat WTP | Image Flat has a comprehensive, automated control system. Alarms will trigger a call-out system to signal problems when the plant is not attended. There is a limited remote operation capability. |
| Mooloolah River | Ewen Maddock WTP | This plant is currently being commissioned. |

| Catchment | Facility | Operation[46] |
|---|---|---|
| Bribie Island Groundwater | Banksia Beach WTP | The plant can operate automatically. Alarms send text messages to on-call operators to signal problems. Operators can remotely dial-in to operate the plant and acknowledge alarms.<br>There is on-line monitoring for reservoir levels and pump failures, power failure, turbidity, chlorine and pH. |
| | Woorim WTP | The plant is manually operated. Alarms will trigger a call-out system to signal problems when the plant is not attended. The plant cannot be operated remotely.<br>There is on-line monitoring for pH, reservoir levels and pump failures. There is no on-line monitoring for turbidity, chlorine or power failure |
| Caboolture River | Caboolture WTP | Caboolture WTP is operated automatically. Alarms will trigger a call-out system to signal problems when the plant is not attended. There is limited control remotely and remote monitoring requires more security.<br>Some additional online monitoring is required. |
| North Pine River | Petrie WTP | Petrie WTP has a fully automated control system. Operators can monitor remote equipment through telemetry. |
| | Dayboro WTP | The plant can operate automatically, and can be monitored and operated by the operators at Petrie WTP.<br>There is on-line monitoring for reservoir levels, pump failures, turbidity and chlorine. There is no on-line monitoring for power failure or pH. |
| | North Pine WTP | North Pine has a comprehensive, automated control system. While the plant is capable of 24 hour operation, with remote control from Mt Crosby after hours, it is currently only operated while attended to monitor water quality variations. |
| North Stradbroke Island Groundwater | Dunwich WTP | The plant is automatically operated. Alarms will trigger a call-out system to signal problems when the plant is not attended. There is remote stop / start control. |

| Catchment | Facility | Operation[46] |
|---|---|---|
| | Amity Point WTP | The plant is automatically operated. Alarms will trigger a call-out system to signal problems when the plant is not attended. Operators can access the plant remotely. There is monitoring and remote stop / start control. |
| | Point Lookout WTP | The plant is automatically operated. Alarms will trigger a call-out system to signal problems when the plant is not attended. Operators can access the plant remotely. There is monitoring and remote stop / start control. |
| | North Stradbroke WTP | The plant is automatically operated. Alarms will trigger a call-out system to signal problems when the plant is not attended. Operators can access the plant remotely. There is monitoring and remote stop / start control. |
| Tingalpa Creek | Capalaba WTP | The plant is automatically operated. Alarms will trigger a call-out system to signal problems when the plant is not attended. The plant cannot be controlled remotely. |
| Lower Brisbane | Enoggera WTP | The plant is currently being refurbished. |
| Brisbane Groundwater | Algester WTP | The plants have comprehensive on-line analysis and are remotely monitored from Mt Crosby. They operate continuously except in the event of problems, and have an auto-turn off capability in the event that water quality parameters exceed pre-determined thresholds. Re-starts must be operator initiated. |
| | Chandler WTP | |
| | Forest Lake WTP | |
| | Runcorn WTP | |
| | Sunnybank WTP | |

### 7.5.1 HACCP Systems

Some of the previous owners of the Seqwater assets had developed HACCP (Hazard Analysis and Critical Control Points) systems at a number of facilities.

HACCP is a system used for managing production quality, which is increasingly being used in the water industry. It provides a framework for identifying what system parameters should be monitored, how results should be interpreted and when corrective action should be undertaken. The Australian Drinking Water Guidelines note that the HACCP approach is highly compatible with the approach outlined in the guidelines.

Seqwater is extending the coverage of HACCP across all its treatment facilities in conjunction with the development of Drinking Water Quality Management Plans.

HACCP systems are developed by first identifying hazards to acceptable water quality, and then identifying critical control points at different parts of the process. The Seqwater systems use a mix of on-line and manual water quality sampling.

Corrective action is required when water quality parameters exceed critical limits. The Seqwater systems also identify near-misses, which are used as to signals to identify potential weakness which could cause critical limits to be exceeded in the future.

## 7.6 Staffing and Resources

The Operations Group has responsibility for the operation of the assets. The Dam Safety & Source Operations Team operates all the dams, other water sources and irrigation assets. It also undertakes the Dam Safety management function. The Coastal Operations and Central Operations Teams manage the water treatment facilities, with different geographical responsibilities[49]. The Technology Services Operations Team provides process analysis support and other technical functions. The structure of the Operations Group is depicted in Figure 7-1.

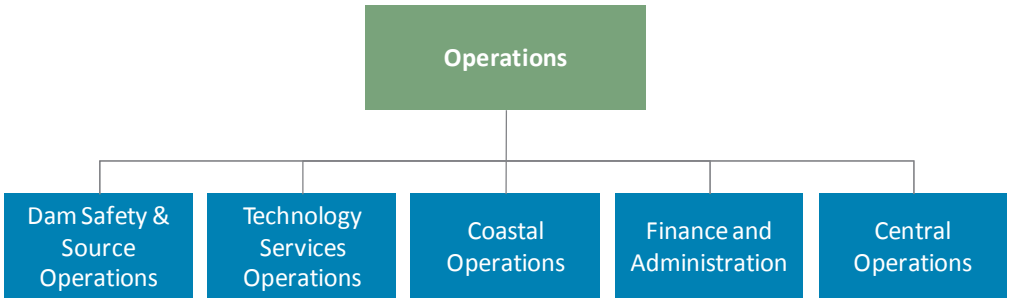


**Figure 7-1 Operations Group Structure**

[49] The area managed by the Central Operations Group includes the Brisbane River, North Pine River, Lockyer Valley and Tingalpa Creek catchments, the Brisbane Groundwater area, North Stradbroke Island and the facilities in the Stanley River catchment excluding Woodford WTP. It also includes Jimna WTP. All remaining water treatment plants are managed by the Coastal Operations Group.

The Business and Asset Services Group has responsibility for maintenance delivery and minor enhancements, the planning of strategic maintenance and renewals, and provides support services such as the development and maintenance of asset data systems. The group structure is depicted in Figure 7-2.

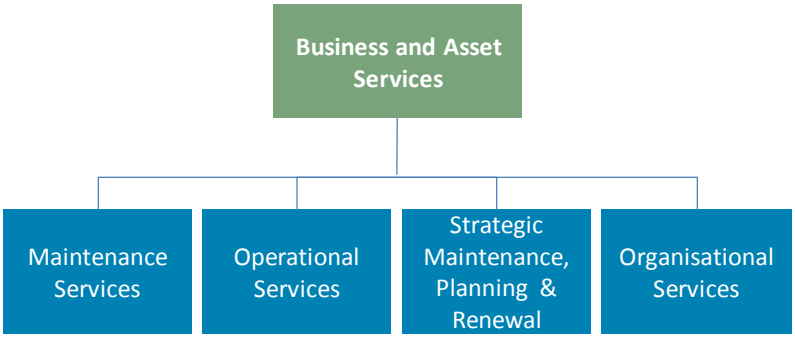


**Figure 7-2 Business and Asset Services Group Structure**

The Sustainable Water and Asset Delivery Group has overall responsibility for the asset portfolio, including major new works and upgrades, the delivery of capital works, and catchment and water quality management. The structure of the group is depicted in Figure 7-3.

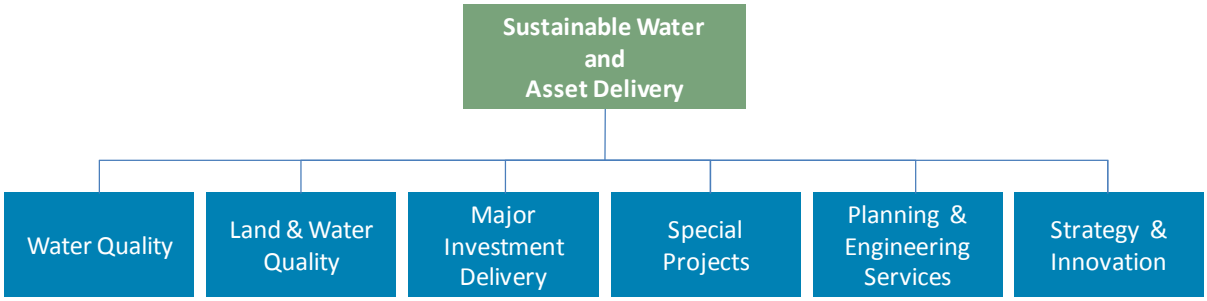


**Figure 7-3 Sustainable Water and Asset Delivery Group Structure**

## 7.7 Operating Procedures

Except where specific improvements have been made since its formation, Seqwater is continuing to operate the assets using the procedures developed by the previous owners of the assets.

In many cases, copies of those procedures are only held at the facilities themselves. Seqwater was formed at the same time as the local government amalgamations, and the document transfer to a central registry is still continuing.

To facilitate this transfer, Seqwater has implemented a formal document management process.

Over 700 documents have been so registered so far. Extrapolating from this figure, there may be several thousand documents across the asset base. Registration of the documentation will provide a consolidated database, which in turn will allow any gaps in the documentation coverage to be identified.

Examples of the type and content of documents in existence are provided in Table 7-3.

**Table 7-3 Example Operating Procedures**

| Facility Type | Example Operating Procedures |
|---|---|
| Water Treatment Plants | • Advice for Specific events e.g.<br>  ○ After Hours Call alarm<br>  ○ Plant start up / Shut Down<br>  ○ Operation of specific plant components<br>  ○ Polyelectrolyte Dose Rate<br>  ○ Manual Backwashing<br>  ○ Manual Chemical Batching<br>  ○ Sample pumps operation and change duty procedure<br>• Allowance for maintenance e.g.<br>  ○ Clarifier Isolation & Drain down<br>  ○ Breathing Apparatus<br>  ○ Calibration sheet<br>  ○ Emergency Equipment Testing at plants<br>• Monitoring of plant items under HACCP plans e.g.<br>  ○ Filtration and Turbidity Control<br>  ○ Alum Dosing<br>  ○ Carbon Dosing<br>• Miscellaneous e.g.<br>  ○ Stormwater management Plan<br>  ○ Waste management plan<br>  ○ Algal management plan<br>  ○ Accident/Incident Reporting<br>  ○ Handling of Goods |
| Reservoirs | • Internal inspection.<br>• Cleaning.<br>• Biological test.<br>• Inspect control valves.<br>• Valves inspection. |

Specific operating procedures and other documentation also exist for referable dams as required by Dam Safety Conditions.

Specific maintenance work instructions have also been developed for much of the equipment. These documents are being managed in a similar manner to the operating procedures.

## 7.8 Maintenance Activities

Seqwater is developing its approach to maintaining its assets. Table 7-4 outlines the typical maintenance activities that are undertaken on the asset types owned by Seqwater.

**Table 7-4 Maintenance Activities**

| Facility Type | Maintenance Approach |
|---|---|
| Dams | • The overall program of dam safety monitoring, inspections and reviews.<br>• Testing and inspections of mechanical and electrical equipment in outlet works and spillways.<br>• Periodic inspection of visible surfaces and spot repairs if necessary.<br>• Cleaning and vegetation control. |
| Treatment Plants / Pump Stations | • Corrective and preventative maintenance on mechanical and electrical equipment.<br>• Calibration of monitoring equipment.<br>• Periodic inspection of visible concrete surfaces. Inspections of normally submerged surfaces during downtime. Further tests and repairs if necessary.<br>• Periodic inspection of visible metalwork. Inspections of normally submerged metalwork and fittings during clarifier / filter downtime. Periodic recoating and spot repairs.<br>• Periodic joint reseals. |
| Raw Water Mains | • Where, possible periodic inspections during downtime.<br>• Cathodic protection monitoring and replenishment (where installed and depending on system type).<br>• Periodic recoating of external surfaces (if appropriate). |
| River Intakes | • Vegetation control.<br>• Periodic inspections of visible surfaces. Spot repairs if necessary. |
| Reservoirs | • Periodic inspections of external surfaces.<br>• Periodic cleans and internal inspections during downtime. Further tests and repairs if necessary.<br>• Periodic recoating of external surfaces (if appropriate). |

Seqwater intends to develop its maintenance approach over time to optimise the delivery of maintenance and ensure that risks are well managed.

## 7.9 Maintenance Delivery

Many of the previous owners of the assets had maintenance staff with responsibility extending beyond the water treatment plants and water sources. In those cases, relatively few of the maintenance staff have transferred to Seqwater. In some instances, Seqwater has elected to adopt Service Level Arrangements with those organisations to provide for the ongoing maintenance of the assets formerly owned and operated by those organisations.

Seqwater staff undertake the principal maintenance tasks on assets formerly owned by the former SEQWater, SunWater and Aquagen, and on assets that have been transferred from Brisbane City Council, and most of the work in the amalgamated Somerset Regional Council.

Service level arrangements have been established with Gold Coast City Council, the amalgamated Sunshine Coast (excluding Noosa), Scenic Rim Regional, Moreton Bay Regional Councils, and with Logan City Council.

Maintenance of Noosa WTP and the upstream facilities is carried out by Veolia under the design-build-operate arrangement for Noosa WTP. Mechanical electrical maintenance at Redland City Council was carried out under contract by an external contractor, and that arrangement is continuing.

The SCADA systems are managed through SLA's by the local governments in the cases where the systems are shared.

Civil and ground maintenance is undertaken partly by operators and rangers, and partly through service level agreements.

## 7.10 Maintenance Systems and Data

The amount of asset data and the data conventions and hierarchies used varied significantly amongst the former owners of our assets.

Ensuring that there was sufficient and high enough quality data to support maintenance work ordering across the asset base was one of the priority tasks when Seqwater was formed.

Teams of Seqwater staff inspected all the facilities where Seqwater controls the maintenance schedule to ensure that the key assets were all identified in the schedules.

Seqwater is planning to implement a new Corporate Information System with a comprehensive maintenance management capability.

## 7.11 Performance Reporting

Seqwater has reporting obligations to the Water Grid Manager under the Market Rules, and DERM for legislation relating to drinking water quality.

Seqwater meets these requirements.

# 8. CAPITAL WORKS

## 8.1 Renewals

Seqwater inherited infrastructure in various levels of condition. In the short term the focus has been on the renewal of assets with the highest risk of failure. These assets have been identified from:

- Inspections undertaken by Seqwater staff;
- Condition assessment reports prepared as part of the Technical Due Diligence undertaken on behalf of the Queensland Treasury prior to the transfer of the assets to Seqwater.

Seqwater is developing its approach to identifying and prioritising asset renewals. The approach includes:

- Ongoing condition assessments of assets;
- Analysis of asset performance based on maintenance management system outputs;
- Prioritising infrastructure investment (new / augmentation works as well as renewals) and refining the capital works program on annual basis.

The QWC has determination powers for capital works. It is expected that the Water Grid Manager's views would also be considered as part of the process.

## 8.2 New Works and Enhancements

The main immediate considerations for non-renewal capital works are[50]:

- The raising of the Hinze Dam;
- Addressing any significant water treatment risks;
- Implementation of fluoride at the largest South-East Queensland water treatment plants by December 2008[51] and planning and design for the implementation of fluoride at the remaining water treatment plants by December 2009.

Construction of the Wyaralong water treatment plant may also commence, subject to approval by the Queensland Water Commission.

The approach adopted by Seqwater completes works already commenced to provide for water security across the region, provides for the State Government's timetable to provide fluoridation, and otherwise addresses many of the highest service risks.

[50] The DERM guidelines do not require that the Strategic Asset Management Plan address new works and enhancements. However, for completeness some comments are provided.
[51] Fluoridation commenced in 2008 at Molendinar, Mudgeeraba, Mt Crosby East Bank, Mt Crosby West Bank, Lander's Shute and North Pine water treatment plants.

Source enhancements undertaken by Seqwater will primarily involve spillway upgrades to meet the Queensland Dam Safety Management Guidelines. Spillway assessments were not all completed by the previous asset owners. Our Dam Safety Group has negotiated a preliminary timetable for completion of spillway assessments with DERM.

Other than the projects identified above, augmentation of treatment facilities in the near-term will be primarily aimed at improving quality and addressing risks rather than providing additional capacity.

The outlook for non-renewal capital works depends in part on a number of factors that are not entirely within the control of Seqwater. These include:

- The decisions made by the QWC for future water source augmentation and water treatment capacity augmentation;
- The development of a risk management strategy and emergency response plans in conjunction with the Water Grid manager and other Grid Participants;
- The decisions made by the QWC (as the price regulator) and SEQWGM (as the purchaser of services);
- The arrangements made for the future provision and sharing of SCADA information across the Water Grid between Seqwater, LinkWater and the future distribution entity.

# 9. ACTION PLAN

The Action Plan is provided in Table 9-1. The Action Plan may be further refined as the capabilities of the assets are better understood and as the requirements of the SEQWGM are clarified. Full implementation of the Action Plan may depend in part upon agreement between the QWC (as the price regulator) and SEQWGM (as the purchaser of services). Where time and resources allow, actions identified for years 3-5 of the Action Plan may be brought forward.

**Table 9-1 Action Plan**

| Category | Action | Responsibility | Target Date |
|---|---|---|---|
| **Years 1-2** | | | |
| Operations | Prepare Grid Service Provider Performance Standards. | Commercial | 30 September 2009[52] |
| | Document the quantitative targets for service levels (e.g. % of time water treatment plants meet required production levels, % of time water quality targets are met), and the methodology used to set service levels in future SAMPs (subject to commercial and regulatory considerations). | Operations / Sustainable Water and Asset Delivery | 30 June 2011 |
| Asset Management | Undertake an initial asset criticality and risk review, in the context of the Water Grid Risk Management Plan and the Grid Participant Risk Management Strategy[53]. Develop appropriate strategies to manage the risks identified in the initial asset criticality and risk review, and use the results to prioritise the development of asset-specific asset management strategies, condition inspections and data collection. | Various | 30 June 2011[54] |

[52] This is the date given in the Market Rules for the preparation of the Grid Service Provider Performance Standard. Many of the items in this Action Plan and other activities undertaken by Seqwater will provide information which will allow the capabilities of the assets, risks, costs and other factors which may influence the definition of the standards to be better understood. Furthermore, the detail and content of the Asset Performance Standard is yet to be defined by the QWC (as Rules Administrator for the Market Rules). While the initial Grid Service Provider Performance Standard will reflect the state of knowledge at the time, future revisions will be required. The Market Rules make provision for amendments of the standard after September 2009, and Seqwater will seek to do so.

[53] The high level asset criticalities and improvement priorities will be agreed with the Water Grid Manager in the Water Grid Risk Management Plan, the Grid Participant Risk Management Strategy and related documents.

[54] The development of asset management strategies will be an iterative and ongoing process. Seqwater will work towards completing the first iteration by 30 June 2011.

| Category | Action | Responsibility | Target Date |
|---|---|---|---|
| | Develop asset management strategies to implement the asset related actions to support the Drinking Water Quality Management plans. | Business and Asset Services | |
| Maintenance | Develop and implement a maintenance delivery strategy. | Business and Asset Services | 30 June 2011 |
| | Implement Technology One as the Corporate Information System, with a comprehensive Maintenance Management function. | Business and Asset Services | |
| | Undertake checks to ensure that similar assets undertaking similar functions are receiving similar maintenance. | Business and Asset Services | |
| | Undertake OH&S reviews and undertake changes as necessary to remedy any significant issues. | Business and Asset Services | |
| Documentation | Commence preparation of detailed asset management plans. | Business and Asset Services | 30 June 2011 |
| | Compile a full list of operational procedures for inclusion in future SAMPs, check that the coverage of operational procedures is complete and consistent, and if necessary develop new procedures where the existing coverage is inadequate. | Operations | |
| | Standardise operational documents over a period of time in conjunction with the adoption of a document management system, and develop new procedures to fill any gaps. | Operations | |
| | Develop new operational procedures or revise the existing procedures where significant process, control or quality assurance changes are occurring. | Operations | |
| OH&S | Undertake OH&S reviews and undertake changes as necessary to remedy any significant issues. | Business and Asset Services | 30 June 2011 |
| Regulatory | Continue assessments of the long-term implications of the meeting the dam safety management guidelines. | Operations | 30 June 2011 |
| Data and Knowledge | Further improve asset register data to support maintenance and asset management activities (e.g. pipelines, high voltage asset components). | Business and Asset Services | 30 June 2011 |

| Category | Action | Responsibility | Target Date |
|---|---|---|---|
| | Collate the existing information on facilities to support risk assessments and other improvement studies. | Various | |
| | Undertake a risk assessment to identify the minimum level of data that should be held for each asset type and the consistency requirements for field labelling of assets and initiate actions to mitigate any high risks identified. | Business and Asset Services | |
| **Years 3-5** | | | |
| Asset Investment | Prepare and formally adopt procedures for capital works program evaluation and prioritisation and capital works project justification. | Sustainable Water and Asset Delivery | 30 June 2014 |
| | Undertake at least a semi-quantitative assessment of the asset related risks, to support the evaluation of potential capital works projects. | Various | |
| | Implement formal project and program management procedures (as appropriate). | Sustainable Water and Asset Delivery | |
| Documentation | Identify the scope of facility specific asset management plans or similar documents and the links to other related documents (e.g. facility specific sections of Drinking Water Quality Management Plans, Operations and Maintenance manuals, other Dam Safety documents), and prepare documents for at least one major facility of each type (treatment plant connected to the physical Water Grid, isolated treatment plant, dam, raw water main). | Business and Asset Services | 30 June 2014 |
| Asset Management | Complete a comprehensive review of the impact of failure scenarios for treatment plants and use the results to revise asset management strategies and maintenance programs as appropriate. | Operations / Business and Asset Services | 30 June 2014 |
| Maintenance | Evaluate the formal risk-based preventative maintenance schedules already implemented at several locations, and use the results of this process to evaluate whether the formal methods should be adopted across the wider asset base. | Business and Asset Services | 30 June 2014 |
| Data and Knowledge | Commence the collation of any other data (if any) following the definition of asset register data requirements. | Business and Asset Services | 30 June 2014 |
| | Develop data policies such as standards for P&IDs and other drawings and conventions for | Business and Asset | |

| Category | Action | Responsibility | Target Date |
|---|---|---|---|
| | consistency for asset identification between P&IDs, field labels, asset register records, SCADA, wiring diagrams, wiring labels. | Services | |

# 10. FINANCIAL ARRANGEMENTS

Seqwater's budgets and financial projections are yet to be finalised pending discussions between the QWC, SEQWGM and Seqwater. Subject to commercial and regulatory considerations, this information will be included in future versions of the SAMP.

# Strategic Asset Management Plan

## CERTIFICATION

The development of this Strategic Asset Management Plan has been facilitated by Aneurin Hughes and Patrick Carter of Cardno based on submissions and contributions from the staff of Seqwater. Components of this Management Plan have specifically been developed to address the requirements of the Water Supply (Safety and Reliability) Act 2008 for a registered Water Service Provider's Strategic Asset Management Plan.

In this regard, the Strategic Asset Management Plan addresses:

- the water supply services for which Seqwater is registered as a services provider;
- the ongoing requirements for operations, maintenance and renewals of the infrastructure used in providing these services; and
- the levels of service that are being targeted.

The elements of this Strategic Asset Management Plan that address the statutory requirements of a Strategic Asset Management Plan are considered appropriate for the service provider's infrastructure, the services for which Seqwater is registered and in keeping with the current expectations of customers, the constraints of budgetary allocations, and to the extent possible with regard to the information provided for inclusion in the plan.

In making this Certification, due consideration has been given to:

- the requirements of the Water Supply (Safety and Reliability) Act 2008 and the Guideline for preparing Strategic Asset Management Plans;
- the need for operational, maintenance and renewals strategies, processes, procedures and actions to achieve the target levels of service standards; and
- the need for adequate financial arrangements to implement all the elements of the Strategic Asset Management Plan.

18 May 2009

Aneurin Hughes MIE Aust, RPEQ No. 4554

Date

Senior Principal & Discipline Leader, Asset Management

Cardno (Qld) Pty Ltd

# Strategic Asset Management Plan

# APPENDIX A

# Catchment Maps

# Strategic Asset Management Plan

# APPENDIX B

# Dam Yield Information

# Strategic Asset Management Plan

## APPENDIX B: DAM YIELDS

This Appendix shows the LOS yield information determined by the Queensland Water Commission[55], mapped to the dams owned by Seqwater.

| Catchment | Name | System Yield (ML/year) |
|---|---|---|
| Nerang River | Hinze Dam | 58,200 |
| | Little Nerang Dam | |
| Logan/Albert Rivers | Maroon Dam | 29,500 |
| | Bromelton Dam | |
| | Nindooninbah Off-Stream Storage | |
| Warrill Valley | Moogerah Dam | 500 |
| Lockyer Valley | Atkinson Dam | - |
| | Clarendon Dam | - |
| | Bill Gunn Dam | - |
| Upper Brisbane River | Lake Manchester Dam | 263,300 |
| | Wivenhoe Dam | |
| Stanley River | Somerset Dam | |
| Mary Valley | Baroon Pocket Dam | 33,000 |
| | Lake MacDonald Dam | 3,500 |
| | Borumba Dam | 7,500 |
| | Cedar Pocket Dam | - |
| Maroochy River | Cooloolabin Dam | 9,100 |
| | Poona Dam | |
| | Wappa Dam | |
| Mooloolah River | Ewen Maddock Dam | 2,500 |
| North Pine River | North Pine Dam | 43,300 |
| | Sideling Creek Dam | |
| Tingalpa Creek | Leslie Harrison Dam | 5,300 |
| Lower Brisbane River | Enoggera Dam | 1,100 |
| | Gold Creek Dam | - |

[55] The yield figures in this report are the LOS (level of service) yield figures sourced from Table 5-3 of the *South East Queensland Water Strategy – Draft,* Queensland Water Commission, March 2008 except Borumba Dam, Lake MacDonald Dam, the South Maroochy system and Moogerah Dam are taken from Table 5-2 of the same document. Table 5-3 of the strategy allows for the yield benefits of the Water Grid whereas Table 5-2 of the strategy does not. Pipelines to connect Borumba Dam, Lake MacDonald Dam and the South Maroochy system to the grid have not been completed. Moogerah Dam is not identified in Table 5-3 of the strategy. The LOS yield is a new approach that specifically allows for the occurrence droughts in the future, and reflects the requirements under the Water Act to reflect level of service objectives in water planning.

The LOS yield information informs the Queensland Water Commission's System Operating Plan. However, Seqwater is governed by the Grid Instructions issued by the SEQWGM, and the water entitlements detailed in section 3. The LOS yield information is provided with the SAMP for information only.

**Dam Yield**