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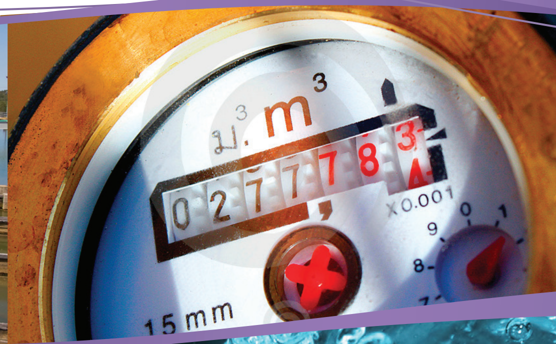
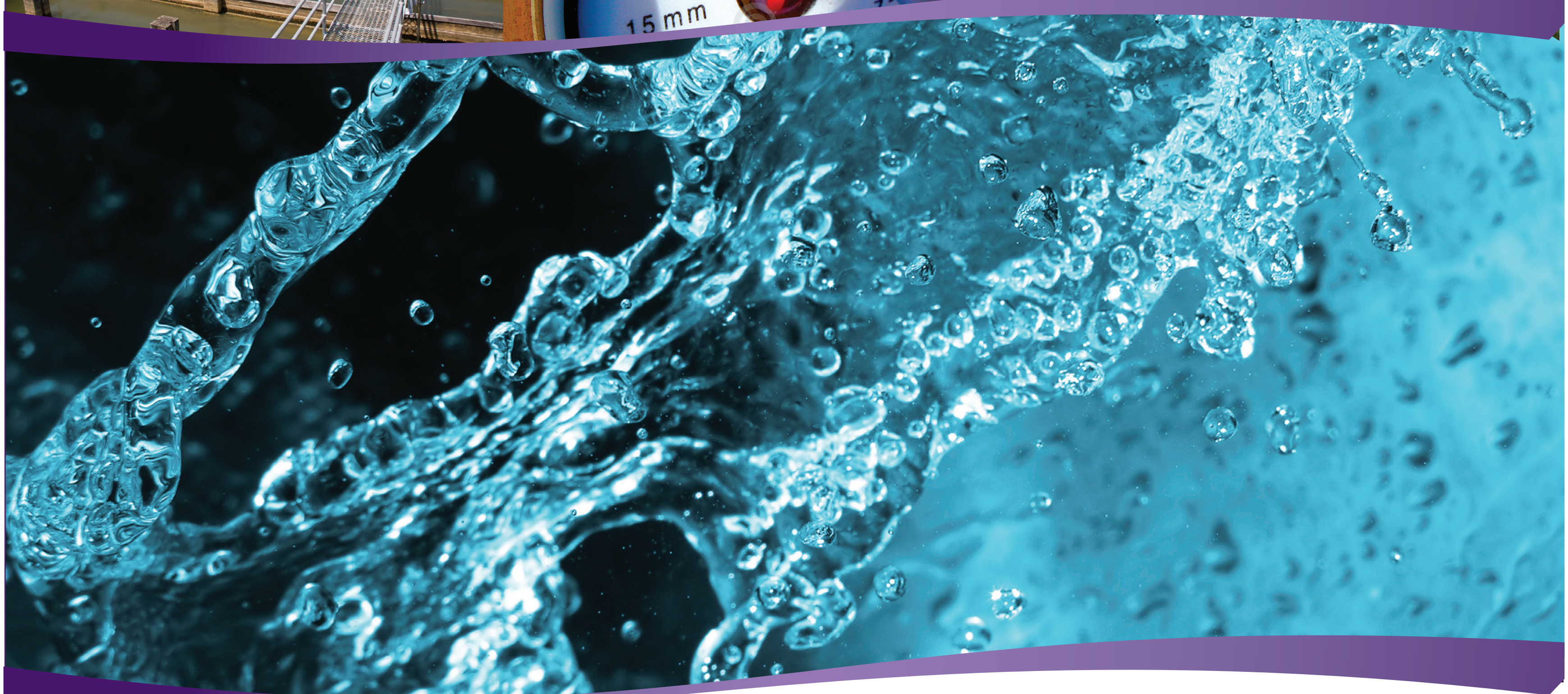
Grid Service Charges 2012-2013:

Phase 2 - Assessment of Capital and Operating Expenditure

Grid Service Provider: Seqwater

March 2012





Grid Service Charges 2012-2013

PHASE 2 – ASSESSMENT OF PRUDENCY AND EFFICIENCY OF OPERATING AND CAPITAL COSTS – SEQWATER

- Rev 2
- Final
- 30 April 2012

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Limitation statement

The sole purpose of this report and the associated services performed by Sinclair Knight Merz Pty Ltd (SKM) is to assist the Queensland Competition Authority (the Authority) in its review of Grid Service Charges for the SEQ Water Grid in accordance with the scope of services set out in the contract between SKM and the Authority. That scope of services, as described in this report, was developed with the Authority.

In preparing this report, SKM has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Authority, the Grid Service Providers and/or from other sources. Except as otherwise stated in the report, SKM has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

SKM derived the data in this report from information sourced from the Authority, the Grid Service Providers and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. SKM has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by SKM for use of any part of this report in any other context.

This report has been prepared within the time restraints imposed by the project program. These time restraints have imposed constraints on SKM’s ability to obtain and review information from the Entities.

This report has been prepared on behalf of, and for the exclusive use of, the Authority, and is subject to, and issued in accordance with, the provisions of the agreement between SKM and the Authority. SKM accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

1. Executive summary

The Queensland Competition Authority (the Authority) commissioned Sinclair Knight Merz Pty Ltd (SKM) to review the prudency and efficiency of capital expenditure and operating expenditure of the two Grid Service Providers (GSPs) – Seqwater and LinkWater. This review is part of the Authority's process to recommend the Grid Service Charges to be applied in 2012/13. The Grid Service Charges represent the amount payable by the South East Queensland (SEQ) Water Grid Manager to the two GSPs for declared water services.

SKM has produced a report for each of the GSPs. This report pertains to the prudency and efficiency of the operating costs and capital expenditure for Seqwater.

1.1. Introduction and background

To inform the recommendations on the 2012/13 Grid Service Charges, the Authority requires the adequacy of the available information and the prudency and efficiency of the capital and operating expenditure proposed by each of the GSPs for the 2012/13 financial year to be assessed against relevant service standards and industry best practice.

The Authority appointed SKM to review the capital and operating expenditure forecasts for declared services from July 2012 to June 2013. Declared water services include the storage, production, treatment and transport of water to grid customers, including retailer-distributor entities.

1.2. Information adequacy

Seqwater has supplied supporting information to enable SKM to complete an assessment of the prudency and efficiency for a sample of fifteen operating expenditure costs, fourteen 2012/13 capital expenditure costs and eleven 2011/12 capital expenditure costs. Seqwater has shown a genuine attempt to comply with the information request from both the Authority and SKM, and SKM understand that Seqwater intends to continue to work with the Authority to provide information in the future.

Various obstacles to reporting were encountered, these included:

- Information adequacy
- Timeframe of review
- Location of this review in the project delivery journey

It is acknowledged that there is a short timeframe in which to provide the required information, however the information should be available as a result of good practice. Notwithstanding the above, Seqwater staff cooperated extensively and worked beyond normal business hours to respond to requests and queries. This commitment is appreciated.

The provision of information was reasonable. The inability to provide all relevant information has resulted in the review of some of the projects not being completed and consequently approval not being able to be provided.

1.3. Policy and procedure review

SKM has reviewed Seqwater's capitalisation policy, budget formation, strategic development plans, risk and asset management planning, corporate directives, external drivers, procurement and cost allocation. A short summary of SKM's findings is presented below:

- **Capitalisation policy** – Seqwater capitalises the cost incurred in acquiring property, plant and equipment upon the initial purchase or construction thereof. The purchase price includes the cost for import duties and other taxes. Once the asset is in place and in a condition where it is operated in the intended manner, capitalisation of cost ceases
- **Strategic development plans** – Seqwater has not developed strategic development plans as no direction has been given by the SEQ Water Grid Manager. At present Seqwater relies on the plans and frameworks developed as part of the asset management system
- **Risk and asset management planning** – Seqwater has made significant progress in developing robust asset management processes and procedures for comprehensive asset information. While Seqwater may not currently have good asset condition information due to its recent formation and the lack of condition information transferred from previous owners/ operators, SKM considers that the plans and processes that Seqwater has adopted to assess the condition of its assets will rectify the situation if carried through
- **Corporate directives** – Seqwater has adopted objectives of corporate governance which are based on those set out in *AS 8000-2003 – Good Governance Principles* (The Australian Governance Standard)
- **External drivers** – Seqwater does not have nor is required to have a demand forecasting policy or process. Seqwater does not currently have its own standard of service in place; SKM does note that Seqwater has internal KPI's in place as indicators of performance for management and improvement purposes. KPIs have been established to monitor and report on progress towards these standards, including: Source and off-take water quality standards, Supply quantity and quality and Infrastructure condition and capability
- **Procurement** – While Seqwater's procurement policies and procedures do not provide for sustainable purchasing per se, its requirement to adhere to State Procurement Policy does require it to integrate sustainability into the procurement of goods, services and construction. A further concern that we have is the arrangement for sole sourcing from tender panels. The relatively high limit of up to $100,000 of such single source purchases with limited required review from supervisory managers could allow misuse. It may be prudent for further limits to be placed on such an arrangement
- **Cost allocation** – SKM suggest that there may be merit in the Authority agreeing with both LinkWater and Seqwater, the data to be captured and mechanism for apportionment of cost to allow assessment of cost allocation in the future

1.4. Operational expenditure

Table 1 below presents a summary of the prudency and efficiency reviews of Seqwater's operating expenditure. From the review undertaken by SKM all but one operating expenditure project reviewed was determined to be efficient.

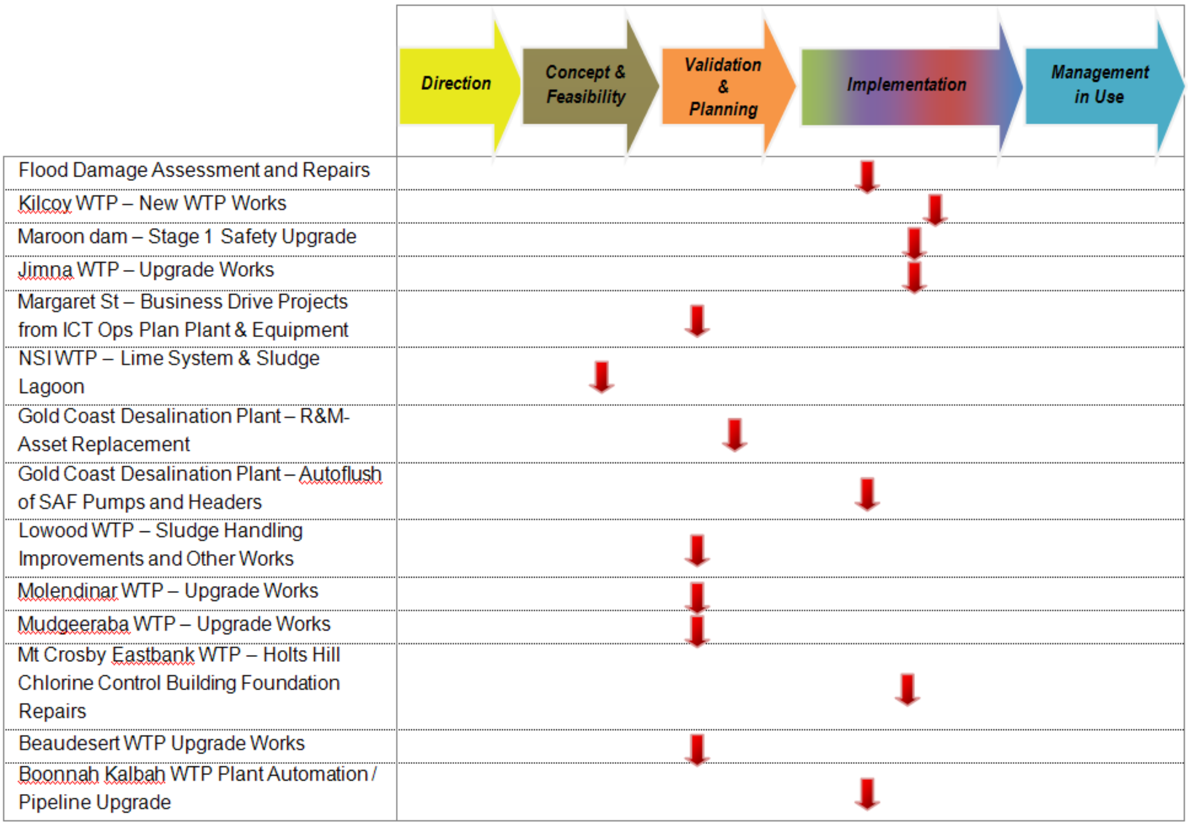
▪ **Table 1 Summary of revised operating costs ($000s)**

	Operating Expenditure item	Asset	Value $000s (2012/13)	Prudent	Efficient	Revised Value ($000s)
1	Catchment Management & Maintenance - Salaries and Wages - Awards + Repairs & Maintenance	Wivenhoe Dam	746	Prudent	Efficient	746
2	Dam and Source Ops - Employee costs	North Pine Dam	342	Prudent	Efficient	342
3	Employee Expenses	Bundamba AWTP	2,419	Prudent	Insufficient information to assess all expenditure as efficient	2,085
4	People and Culture	Corporate Costs	4,350	Prudent	Expenditure efficient except recruitment fees	4,154
5	Electricity	Mt Crosby Eastbank WTP	2,503	Prudent	Efficient	2,503
6	Treatment Chemicals	Landers Shute WTP	1,315	Prudent	Efficient	1,315
7	Electricity	Luggage Point AWTP	1,652	Prudent	Efficient	1,652
8	Repairs & Maintenance	Gold Coast Desalination Plant	5,167	Prudent	Efficient	5,167
9	Repairs & Maintenance	Pipeline Network	2,997	Prudent	Partially efficient	2,873
10	ICT Services	Corporate Costs	12,871	Prudent	Efficient	12,871
11	Repairs & Maintenance	Molendinar WTP	1,289	Prudent	Efficient	1,289
12	Infrastructure Maintenance - Planned	North Pine WTP	628	Prudent	Efficient	628
13	Infrastructure Maintenance - Scheduled	Mt Crosby Westbank WTP	508	Prudent	Efficient	508
14	Catchment Management & Maintenance - Repairs & Maintenance	Hinze Dam	491	Prudent	Efficient	491
15	Water Quality Monitoring	Gold Coast Desalination Plant	520	Prudent	Efficient	520

1.5. Capital expenditure 2012/13

A sample of fourteen projects were identified and assessed as a representative sample of the capital expenditure program for 2012/13 for Seqwater. SKM has assessed these projects against the Authority's definitions of prudency in particular the relevant driver and the decision making process and efficiency, including the standards of works, scope of work, timeliness of delivery and the costs.

The status of the fourteen projects relative to the Seqwater Delivery Framework is illustrated in **Figure 1.**



- **Figure 1 Status of projects within the Seqwater Delivery Framework**

The capital expenditure of six of fourteen projects were assessed as both prudent and efficient. The exceptions are:

- Flood Damage Assessment and Repairs
- Maroon Dam - Stage 1 Safety Upgrade
- North Stradbroke Island Water Treatment Plant - Lime System and Sludge Lagoon
- Lowood Water Treatment Plant - Sludge Handling Improvements and Other Works
- Molendinar Water Treatment Plant - Upgrade Works
- Mudgeeraba Water Treatment Plant - Upgrade Works
- Beaudesert Water Treatment Plant Upgrade Works
- Boonah Kalbar Water Treatment Plant - Plant Automation/Pipeline Upgrade

Table 2 provides an overview of the final assessment made for each project of the project sample chosen for assessment of prudency and efficiency

- **Table 2 2012/13 sample project summary - revised capital expenditure profile ($000s)**

Project	Cost 2012/13 ($000s)	Prudent	Efficient	Revised Cost 2012/13 ($000s)
Flood Damage Assessment and Repairs	9,848	Prudent	Insufficient information to assess all expenditure as efficient	0
Kilcoy WTP - New WTP Works	14,931	Prudent	Efficient	14,931
Maroon Dam - Stage 1 Safety Upgrade	4,000	Prudent	Insufficient information to assess all expenditure as efficient	3,800
Jimna WTP - Upgrade Works	1,661	Prudent	Efficient	1,661
Business Driven Projects from ICT Ops Plan Plant & Equipment	1,700	Prudent Note: Insufficient information to assess expenditure beyond 2012/13 as prudent	Efficient Note: Insufficient information to assess expenditure beyond 2012/13 as efficient	1,700
NSI WTP - Lime System & Sludge Lagoon	1,075	Insufficient information to assess expenditure as prudent	Efficiency not assessed	0
Gold Coast Desalination Plant - R&M-Asset Replacement	3,812	Prudent	Efficient	3,812
Gold Coast Desalination Plant - Autoflush of SAF Pumps and Headers	1,975	Prudent	Partially efficient	1,544
Lowood WTP - Sludge Handling Improvements and Other Works	2,000	Prudent	Insufficient information to assess expenditure as efficient	0
Molendinar WTP - Upgrade Works	2,000	Insufficient information to assess expenditure as prudent	Efficiency not assessed	0
Mudgeeraba WTP - Upgrade Works	2,000	Insufficient information to assess expenditure as prudent	Efficiency not assessed	0
Holts Hill Chlorine Control Building Foundation Repairs	1,654	Prudent	Efficient	1,654
Beaudesert WTP Upgrade Works	2,500	Insufficient information to assess expenditure as prudent	Efficiency not assessed	0
Boonah Kalbar WTP Plant Automation / Pipeline Upgrade	2,500	Prudent	Insufficient information to assess all expenditure as efficient	2,500

- **Table 3 Seqwater capital expenditure review 2012/13**

Section of Capex review	Flood Damage Assessment and Repairs	Kilcoy WTP - New WTP Works	Maroon Dam Stage 1 Safety Upgrade	Jimna Water Treatment Plant Upgrade Works	Business Driven Projects from ICT Ops Plan Plant and Equipment	NSI Lime System Sludge Lagoon	GCDP Repairs & Maintenance	GCDP Autoflush SAF Pumps Header	Lowood WTP – Sludge Handling Improvements	Molendinar Water Treatment Plant upgrade	Mudgeeraba Water Treatment Plant Upgrade	Holts Hill Chlorine Control Building foundation repairs	Beaudesert Water Treatment Plant Upgrade	Boonah Kalbar Water Treatment Plant – Automation/Pipeline Upgrade
Project description														
Provided documentation														
Prudency														
Cost driver														
Decision making process														
Efficiency														
Scope of works														
Standards of work														
Project cost														
Policy and procedures														
Timing and deliverability														
Efficiency gains														
Allocation of overhead costs														

Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

Table 3 summarises the adequacy of information for the fourteen projects.

Comparing the project status, prudency and efficiency assessment and adequacy of information illustrates that projects further along the implementation journey are more likely to have more adequate information and be assessed as prudent and efficient. It is noted that this assessment is at a specific point in time, and that the purpose of this review is to determine the validity of entry of costs into the RAB.

Consequently there is a situation whereby this review is unable to confirm the prudency or efficiency due to its position in the implementation journey, whilst good practice requires an allowance to be made in Seqwater's forward budget.

Where prudency and/or efficiency cannot be established, this does not solely mean that the project is inappropriate, it may mean that the status of the project is not sufficiently progressed to enable confirmation of entry of all costs into the RAB. A contributing factor to this maybe the frequency of reviews being shorter than the implementation period of large capital expenditure projects.

Information requirement to enable the completion of the review are indicated in **Section 7**.

1.6. Capital expenditure 2011/12

A sample of eleven projects of the capital expenditure program for 2011/12 were identified as requiring additional review due to unexpected increases in actual estimated costs compared with approved budget and were consequently assessed. We have assessed these projects against the Authority's definitions of prudency in particular the relevant driver and the decision making process and efficiency, including the standards of service, scope of work, timeliness of delivery and the costs.

Four of the eleven projects have not been assessed as efficient**. Table 4** provides an overview of the final assessment made for each project of the project sample chosen for assessment of prudency and efficiency.

- **Table 4 2011/12 sample project summary - revised capital expenditure profile ($000s)**

Project	Estimated actual value 2011/12 ($000s)	Prudent	Efficient	Revised value 2011/12 ($000s)
North Pine Dam Gates Upgrade	873	Prudent	Efficient	873
Mt Crosby WTP Water Quality Improvement	3,769	Assessment not required	Efficient	3,769
North Pine WTP Filter Upgrade	2,551	Assessment not required	Insufficient information to assess expenditure as efficient	1,800
Mt Crosby Eastbank WTP High Voltage Renewals	1,374	Assessment not required	Insufficient information to assess expenditure as efficient	690
North Pine WTP Fluoride Dosing Point Relocation	1,048	Assessment not required	Efficient	1,048
Mt Crosby Westbank Renewals	814	Assessment not required	Efficient	514

Project	Estimated actual value 2011/12 ($000s)	Prudent	Efficient	Revised value 2011/12 ($000s)
Various WTP Chemical Dosing Improvements	1,132	Assessment not required	Insufficient information to assess expenditure as efficient	750
Mt Crosby Eastbank Renewals	1,049	Assessment not required	Efficient	1,049
AMS: P&C - Intranet Stage 2 & 3	400	Assessment not required	Efficient	400
Caboolture WTP Renewals	378	Assessment not required	Efficient	378
Esk WTP Renewals	289	Assessment not required	Insufficient information to assess expenditure as efficient	49

The adequacy of information supplied is summarised in **Table 5**.

- **Table 5 Seqwater capital expenditure review 2011/12**

Section of Capex review	North Pine Dam Gates Upgrade	Mt Crosby Water Treatment Plant Water Quality Improvement	North Pine WTP Filter Upgrade	Mt Crosby High Voltage Upgrade	North Pine WTP Fluoride Dosing Point Relocation	Mt Crosby Westbank Water Treatment Plant renewals	Various Water Treatment Plant Chemical Dosing improvements	Mt Crosby Eastbank Water Treatment Plant Renewals	Asset Management System: P&C - Intranet Stage 2 & 3	Caboolture Water Treatment Plant Renewals	Esk WTP Renewals
Project description											
Provided documentation											
Prudency											
Cost driver		Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required
Decision making process		Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required
Efficiency											
Scope of works											
Standards of work											
Project cost											
Policy and procedures											
Timing and deliverability											
Efficiency gains											
Allocation of overhead costs											

Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

Comparison of the efficiency assessment and the adequacy of information table illustrates that documentation regarding decision making, costs and adherence to policy and procedures are the common issues.

It is recommended that the above additional information is gathered and the projects resubmitted the extent of this information is detailed in **Section 8**.

2. Introduction

The Queensland Competition Authority (the Authority) is required to recommend the Grid Service Charges (GSCs) to be applied in 2012/13. GSCs represent the amount payable by the South East Queensland Water Grid Manager (SEQ Water Grid Manager) to the two separate Grid Service Providers (GSPs): Seqwater and LinkWater; for declared water services.

To assist it in this process, the Authority has appointed SKM to:

- Conduct a review of available information on operating cost categories for functional and corporate cost centres and for specific asset operation and maintenance, benchmark costs using benchmark metrics such as $/ML storage against similar entities with similar assets, investigate for any duplication of effort and investigate for any potential efficiencies
- Conduct a review available information, undertake sample selection, organise and attend a project review meeting with Authority, undertake a gap analyses, conduct interviews with the GSPs, prepare information requests, undertake a review policy and procedures and standards of service, undertake assessments of prudency and efficiency and conduct a review allocation of overhead costs
- Conduct a review available information, complete project identification, organise and attend a project review meeting with Authority, undertake a gap analyses, conduct interviews with the GSPs, undertake a review supporting documentation, undertake assessments of prudency and efficiency
- Conduct a review available information, undertake sample selection, organise and attend a project review meeting with Authority, undertake a gap analyses, conduct interviews with the GSPs, undertake a review supporting documentation, undertake a review policy and procedures, undertake assessments of prudency and efficiency, conduct a review allocation of overhead costs, undertake a review of the capital and operating expenditure forecasts for declared services over the period from July 2012 - June 2013, undertake a review of non-drought capital expenditure for the period between July 2011 - June 2012 and undertake a review of fixed and variable operating expenditure for the period between July 2011 and June 2012

The consultancy consists of two phases:

- Phase 1:
  - Fixed and variable OPEX review – Review available information on operating cost categories for functional and corporate cost centres and for specific asset operation and maintenance, benchmark costs using benchmark metrics such as $/ML storage against similar entities with similar assets, investigate for any duplication of effort, investigate for any potential efficiencies
- Phase 2:
  - Component 1: Operational Expenditure – Review available information, sample selection, project review meeting with authority, gap analyses, GSP interviews, information request,

policy and procedures review, standards of service review, assessment of prudency, assessment of efficiency, allocation of overhead costs

- Component 2: 2011/12 Estimated Actual Capital Expenditure – Review available information, project identification, project review meeting with authority, gap analyses, GSP interviews, review of supporting documentation, assessment of prudency, assessment of efficiency
- Component 3: 2012/13 Forecast Operational Expenditure – Review available information, sample selection, project review meeting with authority, gap analyses, GSP interviews, review of supporting documentation, policy and procedures review, assessment of prudency, assessment of efficiency, allocation of overhead costs

This report addresses Phase 2 in respect to the review of the capital and operating expenditure for Seqwater.

2.1. Terms of reference

The full terms of reference are included in **Appendix A.**

2.1.1. Scope exclusions

The following items are outside of the scope of SKM's review:

- Discussion of the allowable operation costs (including the Queensland Water Commission and the Authority's charges, finance charges, treatment of depreciation, working capital, asset valuation methodology)
- Review of capital expenditure beyond 2012/13. Review of any capital expenditure within 2012/13 will be reviewed, but for projects spanning multiple years, this review is not include an assessment of prudency and efficiency for future years
- Review of capital costs for 2011/12 where the project was being reviewed for the 2012/13 costs
- Discussion of irrigation schemes and associated costs
- Discussion of potential efficiencies associated with the merger of Seqwater and WaterSecure

2.2. Report overview

This report addresses the benchmarking review and duplication of effort review for Seqwater. The capital and operating expenditure review for LinkWater is contained in a separate report[1].

[1] SKM Seqwater report citation

This report is structured as follows:

- Background
- Information adequacy
- Policy and procedure review
- Operational expenditure
- Capital expenditure
- Proposed revised templates
- Conclusions and overall recommendations

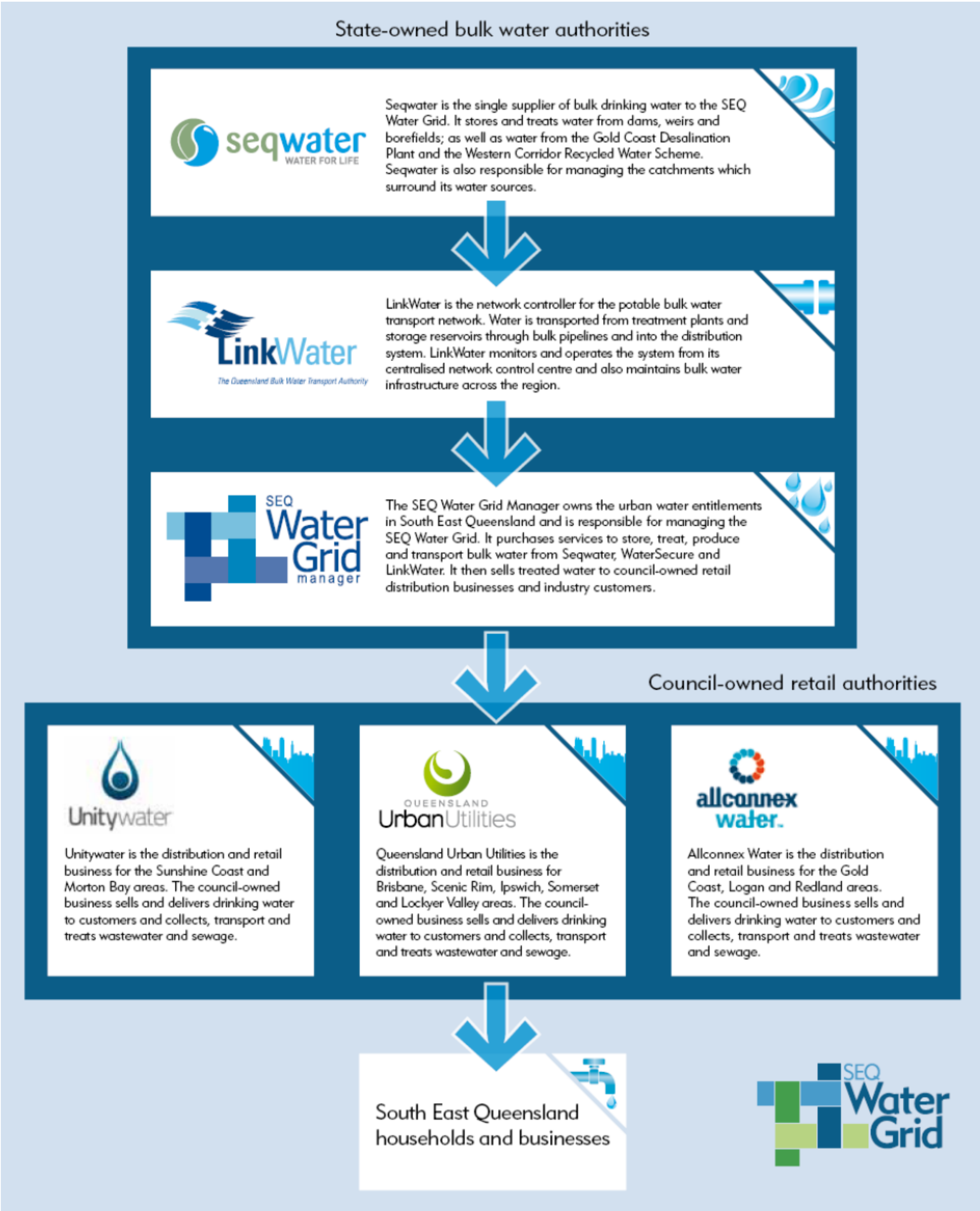
3. Background

3.1. Water Reform and Grid Entities

On 1 July 2008, the Queensland Government implemented a series of reforms in the SEQ water industry by establishing new bulk water entities that own and operate the SEQ Water Grid. Seqwater owns all dams, groundwater infrastructure and water treatment plants in SEQ while WaterSecure owned the desalination plant at the Gold Coast and the Western Corridor Recycled Water Scheme.

On 1 July 2011 Seqwater and WaterSecure merged with Seqwater to form a single bulk water supply authority. The bulk water transmission system is owned by LinkWater. The SEQ Water Grid Manager is responsible for directing the physical operation of the SEQ Water Grid and provides a mechanism to share the costs of the SEQ Water Grid, by acting as the single buyer of bulk water services and the single seller of bulk water for urban purposes. It sells a wholesale ‘pool’ product, reflecting the portfolio cost of supplying retailers with a defined security and quality of supply at a defined bulk supply node.

In addition to the bulk water entities, 10 regional council water utilities were amalgamated into three larger retail distribution entities. These entities now own the water and sewerage distribution infrastructure and sell water and sewage disposal services to customers in their respective areas.


State-owned bulk water authorities
seqwater WATER FOR LIFE
Seqwater is the single supplier of bulk drinking water to the SEQ Water Grid. It stores and treats water from dams, weirs and borefields; as well as water from the Gold Coast Desalination Plant and the Western Corridor Recycled Water Scheme. Seqwater is also responsible for managing the catchments which surround its water sources.
LinkWater
The Queensland Bulk Water Transport Authority
LinkWater is the network controller for the potable bulk water transport network. Water is transported from treatment plants and storage reservoirs through bulk pipelines and into the distribution system. LinkWater monitors and operates the system from its centralised network control centre and also maintains bulk water infrastructure across the region.
SEQ Water Grid manager
The SEQ Water Grid Manager owns the urban water entitlements in South East Queensland and is responsible for managing the SEQ Water Grid. It purchases services to store, treat, produce and transport bulk water from Seqwater, WaterSecure and LinkWater. It then sells treated water to council-owned retail distribution businesses and industry customers.
Council-owned retail authorities
Unitywater
Unitywater is the distribution and retail business for the Sunshine Coast and Morton Bay areas. The council-owned business sells and delivers drinking water to customers and collects, transport and treats wastewater and sewage.
QUEENSLAND UrbanUtilities
Queensland Urban Utilities is the distribution and retail business for Brisbane, Scenic Rim, Ipswich, Somerset and Lockyer Valley areas. The council-owned business sells and delivers drinking water to customers and collects, transport and treats wastewater and sewage.
allconnex water.
Allconnex Water is the distribution and retail business for the Gold Coast, Logan and Redland areas. The council-owned business sells and delivers drinking water to customers and collects, transport and treats wastewater and sewage.
South East Queensland households and businesses
SEQ Water Grid

3.2. The role of the Authority

The Authority is an independent Statutory Authority established by the Queensland Competition Authority Act 1997 and is given the task of regulating prices, access and other matters relating to regulated industries in Queensland.

Under the South East Queensland Water Market Rules (the Market Rules), the Authority is required to recommend the GSCs for the period from 1 July 2012 until 30 June 2013. The Authority is required to provide a report to the Price Regulator setting out its recommendations on GSCs and such information as is reasonably required, to support its recommendations, by no later than 30 June 2012.

GSCs are paid by the SEQ Water Grid Manager to the two GSPs, for the provision of declared water services. Declared water services relate to the storage, production, treatment and transport of water to retailer-distributors and other Grid Customers, such as power stations and irrigators in South East Queensland. A single GSC is applied for each GSP.

3.3. Role of the SEQ Water Grid Manager

The SEQ Water Grid Manager is responsible for directing the short-term operation of the SEQ Water Grid and, by acting as the single buyer of bulk water services and as the single seller of bulk water for urban purposes, provides a mechanism to share the costs of the SEQ Water Grid. It sells a wholesale “pool” product, which reflects the portfolio cost of supplying retailers with a defined security and quality of supply at a defined bulk supply node.

The SEQ Water Grid Manager sells potable water to the three council-owned retail-distributors at a price determined under the SEQ Bulk Water Price Path. A 10-year price path has been projected for bulk water prices, based on assumed interest rates and consumption patterns by the Queensland Government. The Bulk Water Price Path is intended to reach full cost recovery by 2017/18. The bulk water prices are different from the grid service charges payable by the SEQ Water Grid Manager.

3.4. Prudency and Efficiency

The Market Rules do not establish the definition or test to be applied when considering the reasonableness or prudent nature of the proposed expenditure. The *Draft Investigation Plan – SEQ Bulk Water Grid Service Charges for 2011/2012* (Queensland Competition Authority, 2010) defines the Authority’s approach to its assessment of reasonableness and prudency. The Authority proposes to adopt the definitions of prudency and efficiency that were approved by the Minister for Natural Resources Mines and Energy and the Minister for Trade for the interim price monitoring of the SEQ retail distributors.

For the purposes of this consultancy, SKM has adopted the following definitions:

- ***Operating expenditure*** is ***prudent*** if it is required to meet the GSP’s requirements relating to:
  a) its Grid Contract
  b) the South East Queensland System Operating Plan

c) production forecasts for the regulatory period are to consistent with the grid instructions forecast in the Operating Strategy (or any successor documents) and any relevant information provided to the GSPs in accordance with the system operating plan the South East Queensland System Operating Plan

- ***Operating expenditure*** is ***efficient*** if it is undertaken in a least-cost manner over the life of the relevant assets and is consistent with relevant benchmarks. In assessing efficiency, the consultant must have regard to the conditions prevailing in relevant markets, historical trends in operating expenditure and the potential for efficiency gains or economies of scale
- ***Capital expenditure*** is ***prudent*** if it is required as a result of a legal obligation, growth in demand, renewal of existing infrastructure that is currently used and useful, or it achieves an increase in the reliability or the quality of supply that is explicitly endorsed or desired by the SEQ Water Grid Manager
- ***Capital expenditure*** is ***efficient*** if:

a) the scope of the works (which reflects the general characteristics of the capital item) is the best means of achieving the desired outcomes after having regard to the options available, including the substitution possibilities between capex and opex and non-drought network alternatives such as demand management;

b) the standard of the works conforms with technical, design and construction requirements in legislation, industry and other standards, codes and manuals. Compatibility with existing and adjacent infrastructure is relevant as is consideration of modern engineering equivalents and technologies; and

c) the cost of the defined scope and standard of works is consistent with conditions prevailing in the markets for engineering, equipment supply and construction. The consultant must substantiate it view with references to relevant interstate and international benchmarks and information sources. For example, the source of comparable units and indexes must be given and the efficiency of costs justified. The consultant should identify the reasons for any costs higher than normal commercial levels

- SKM must also assess:

a) whether the entities’ policies and procedures for operational and capital expenditure represent good industry practice. In particular, the policies and procedures must reflect strategic development plans, integrate risk and asset management planning, corporate directives, be consistent with external drivers, and incorporated robust procurement practices

b) the standards of service adopted by each GSP and whether these standards have been approved by external agencies

c) assess the appropriateness of any allocation methodology of overhead operating costs

4. Overview of information adequacy

4.1. Summary of information received

Seqwater included the following documents in its submission to the Authority:

- *Cover Letter Re: Seqwater 2012/13 Regulatory Budget Submission*, Seqwater, 29 February 2012
- *Seqwater 2012/13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A1 2012-2013 GSC Information Return Summary.xlsm*, Seqwater, undated
- *A2 Operational Cost Consolidated Inc Allowable.xlsx*, Seqwater, 16 February 2012
- *A3 2012-2013 GSC Information Return RAB 1 July 2012.xlsm*, Seqwater, undated
- *A4 2012-2013 GSC Information Return Working Capital.xlsm*, Seqwater, undated
- *A5 2012-2013 GSC Information Return Allowable Costs.xlsm*, Seqwater, undated
- *A6 2012-2013 GSC Information Return Irrigation.xlsm*, Seqwater, undated
- *A7 2012-2013 GSC Information Return Capex 2011/12.xlsx*, Seqwater, undated
- *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm*, Seqwater, undated
- *A9 Operational Cost Rpt - Mt Crosby Eastbank WTP.xlsx*, Seqwater, 23 February 2012
- *A10 Operational Cost Rpt - North Pine WTP.xlsx*, Seqwater, 23 February 2012
- *A11 Operational Cost Rpt - Molendinar WTP.xlsx*, Seqwater, 23 February 2012
- *A12 Operational Cost Rpt - Landers Shute WTP.xlsx*, Seqwater, 23 February 2012
- *A13 Operational Cost Rpt - Mudgeeraba WTP.xlsx*, Seqwater, 23 February 2012
- *A14 Operational Cost Rpt - Capalaba WTP.xlsx*, Seqwater, 23 February 2012
- *A15 Operational Cost Rpt - Petrie WTP.xlsx*, Seqwater, 23 February 2012
- *A16 Operational Cost Rpt - Noosa WTP.xlsx*, Seqwater, 23 February 2012
- *A17 Operational Cost Rpt - Nth Stradbroke Island WTP.xlsx*, Seqwater, 23 February 2012
- *A18 Operational Cost Rpt - Mt Crosby Westbank WTP.xlsx*, Seqwater, 23 February 2012
- *A19 Operational Cost Rpt - Wivenhoe Dam.xlsx*, Seqwater, 20 February 2012
- *A20 Operational Cost Rpt - Somerset Dam.xlsx*, Seqwater, 20 February 2012
- *A21 Operational Cost Rpt - North Pine Dam.xlsx*, Seqwater, 20 February 2012
- *A22 Operational Cost Rpt - Wyaralong Dam.xlsx*, Seqwater, 20 February 2012
- *A23 Operational Cost Rpt - Leslie Harrison Dam.xlsx*, Seqwater, 20 February 2012
- *A24 Operational Cost Rpt - Hinze Dam.xlsx*, Seqwater, 20 February 2012
- *A25 Operational Cost Rpt - Lake McDonald.xlsx*, Seqwater, 20 February 2012
- *A26 Operational Cost Rpt - Moogerah Dam.xlsx*, Seqwater, 20 February 2012
- *A27 Operational Cost Rpt - Baroon Pocket Dam.xlsx*, Seqwater, 20 February 2012
- *A28 Operational Cost Rpt - Ewen Maddock Dam.xlsx*, Seqwater, 20 February 2012
- *A29 Operational Cost Rpt - Gold Coast Desalination Plant.xlsx*, Seqwater, 20 February 2012

- *A30 Operational Cost Rpt - Bundamba AWTP.xlsx*, Seqwater, 20 February 2012
- *A31 Operational Cost Rpt - Gibson Island AWTP.xlsx*, Seqwater, 20 February 2012
- *A32 Operational Cost Rpt - Luggage Point AWTP.xlsx*, Seqwater, 20 February 2012
- *A33 Operational Cost Rpt - Pipeline Network.xlsx*, Seqwater, 21 February 2012
- *A34 Other Metrics and Labour Metrics.xlsm*, Seqwater, undated

Seqwater provided additional supporting documents for each operational expenditure item and capital expenditure project assessed.

4.2. Operational expenditure

For the assessment of prudency and efficiency of operating expenditure, a sample of costs was selected. Further RFIs were issued to Seqwater to provide detailed information on the fifteen operating expenditure cost items selected for further review. The information requested included the following:

a) how the operating expenditure is required to meet the GSPs requirements relating to either
   - i. Its Grid Contract
   - ii. The SEQ System Operating Plan
   - iii. Forecast required supply under the Water Grid Managers Operating Strategy
   - iv. Its Standard of Service

b) detailed breakdown of how each of the costs has been derived, including:
   - i. Method of calculation (ie top down or bottom up)
   - ii. Details of any indices or escalations that have been applied
   - iii. Baseline data to which the indices have been applied
   - iv. Source of any unit rates used in the calculation
   - v. Source data for quantities used in the calculation (eg a maintenance plan, asset management plan)
   - vi. Allocation methodology used
   - vii. Any other assumptions used in the cost calculation

c) Details to identify the:
   - i. Disaggregation of costs for work completed in-house and work that is contracted to external parties
   - ii. Where external parties are contracted:
     - Evidence of how this service was procured (eg open tender, selected tender, alliance)
     - Duration of the engagement
     - Evidence of the basis of payment for these services (time and expense, indexed, lump sum, unit rates)

  - Internal discussions/rationale behind contracting this service (eg need for specialist personnel)

iii. Where services are completed in house:

  - Number of FTE's directly involved in the service (where appropriate)
  - Reasons why this service is completed in-house (eg practicability, commercially sensitive information)

iv. Evidence of considering alternative methods for delivering this service

v. Details of where the GSP has forecast cost efficiencies or synergies or economies of scale

d) For overhead costs, details of the methodology by which overhead operating costs have been allocated

Seqwater provided initial additional information to meet our requests. This was followed by a meeting with SKM and Seqwater staff to discuss the information provided. Additional requests for information were subsequently sent to Seqwater with regard to details and specific issues that SKM identified and required clarification on. These are further discussed in the Operating Expenditure section of this report (refer to **Section 6** of this report).

4.3. Capital expenditure

The initial submission of capital expenditure information was not in the spreadsheet format requested by the Authority. This resulted in difficulty in identifying an appropriate sample, primarily for the review of 2011/12 projects.

For the assessment of prudency and efficiency of 2012/13 capital expenditure, a sample of projects were selected (refer to **Section 7.3** of this report). Requests for information were issued to Seqwater to provide detailed information on the items within the sample. The information requested included standard policies and procedures and specific project details regarding the need for the project, the scope of works and details of how the project had been developed.

A total of 43 requests for information were forwarded. Responses to the vast majority were received within a timeframe that allowed them to be addressed. In addition an interview was conducted to facilitate the provision of the specific required information. This was particularly useful for the 2012/13 sample projects. Notwithstanding the above, several projects have not been able to be fully assessed due to insufficient information being provided. **Table 6** and **Table 7** illustrates this.

- **Table 6 Seqwater capital expenditure 2012/13 information adequacy**

Section of Capex review	**Flood Damage Assessment and Repairs**	**Kilcoy WTP - New WTP Works**	**Maroon Dam Stage 1 Safety Upgrade**	**Jimna Water Treatment Plant Upgrade Works**	**Business Driven Projects from ICT Ops Plan Plant and Equipment**	**NSI Lime System Sludge Lagoon**	**GCDP Repairs & Maintenance**	**GCDP Autoflush SAF Pumps Header**	**Lowood WTP – Sludge Handling Improvements**	**Molendinar Water Treatment Plant upgrade**	**Mudgeeraba Water Treatment Plant Upgrade**	**Holts Hill Chlorine Control Building foundation repairs**	**Beaudesert Water Treatment Plant Upgrade**	**Boonah Kalbar Water Treatment Plant – Automation/Pipeline Upgrade**
Project description	Green	Green	Green	Green	Green	Amber	Green	Green	Green	Amber	Amber	Green	Red	Green
Provided documentation	Amber	Amber	Amber	Amber	Green	Amber	Amber	Amber	Amber	Amber	Amber	Green	Red	Amber
Prudency														
Cost driver	Green	Green	Green	Green	Green	Green	Green	Green	Green	Amber	Amber	Green	Red	Green
Decision making process	Green	Green	Green	Amber	Green	Amber	Amber	Green	Amber	Green	Green	Green	Red	Amber
Efficiency														
Scope of works	Green	Green	Green	Amber	Green	Amber	Amber	Amber	Amber	Amber	Amber	Green	Red	Green
Standards of work	Green	Green	Green	Green	Green	Amber	Amber	Green	Amber	Amber	Amber	Green	Red	Green
Project cost	Amber	Amber	Amber	Amber	Green	Amber	Amber	Amber	Amber	Amber	Amber	Green	Red	Amber
Policy and procedures	Green	Green	Red	Green	Green	Amber	Amber	Green	Green	Green	Green	Amber	Red	Green
Timing and deliverability	Green	Amber	Red	Green	Green	Amber	Green	Green	Amber	Amber	Amber	Green	Red	Green
Efficiency gains	Amber	Amber	Red	Amber	Green	Green	Green	Amber	Green	Amber	Amber	Green	Red	Green
Allocation of overhead costs	Green	Amber	Red	Green	Green	Amber	Amber	Green	Amber	Amber	Amber	Amber	Red	Green

Legend	Green: Sufficient documentation	Amber: Moderate issues / conflicting documentation	Red: No documentation / major issues with documentation

- **Table 7 Seqwater capital expenditure 2011/12 information adequacy**

Section of Capex review	North Pine Dam Gates Upgrade	Mt Crosby Water Treatment Plant Water Quality Improvement	North Pine WTP Filter Upgrade	Mt Crosby High Voltage Upgrade	North Pine WTP Fluoride Dosing Point Relocation	Mt Crosby Westbank Water Treatment Plant renewals	Various Water Treatment Plant Chemical Dosing improvements	Mt Crosby Eastbank Water Treatment Plant Renewals	Asset Management System: P&C - Intranet Stage 2 & 3	Caboolture Water Treatment Plant Renewals	Esk WTP Renewals
Project description											
Provided documentation											
Prudency											
Cost driver		Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required
Decision making process		Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required
Efficiency											
Scope of works											
Standards of work											
Project cost											
Policy and procedures											
Timing and deliverability											
Efficiency gains											
Allocation of overhead costs											

Legend			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

It is acknowledged that there is a short timeframe in which to provide the required information, however the information should be available as a result of good practice. Notwithstanding the above, Seqwater staff cooperated extensively and worked beyond normal business hours to respond to requests and queries. This commitment is appreciated.

4.4. Obstacles to reporting

Various obstacles to reporting were encountered, these included:

- Information format and adequacy – refer above
- Timeframe of review – the timeframe of the review is short, which when successive requests for information are required to elicit all necessary information compounds the shortness of time. This affects both the provision of information and the review able to be completed
- Location of this review in the project delivery journey. **Figure 2**, below, illustrates the location of the project in the projects delivery framework

Comparing the project status to the information adequacy illustrates that projects further along the implementation journey are more likely to have more adequate information and be assessed as prudent and efficient. It is noted that this assessment is at a specific point in time, and that the purpose of this reviews to determine the validity of entry of costs into the RAB.

Consequently there is a situation whereby this review is unable to confirm the prudency or efficiency due to its position in the implementation journey, whilst good practice requires an allowance to be made in Seqwater forward budget.

Where prudency and/or efficiency cannot be established, this does not solely mean that the project is inappropriate, it may mean that the status of the project is not sufficiently progressed to enable confirmation of entry of all costs into the RAB.

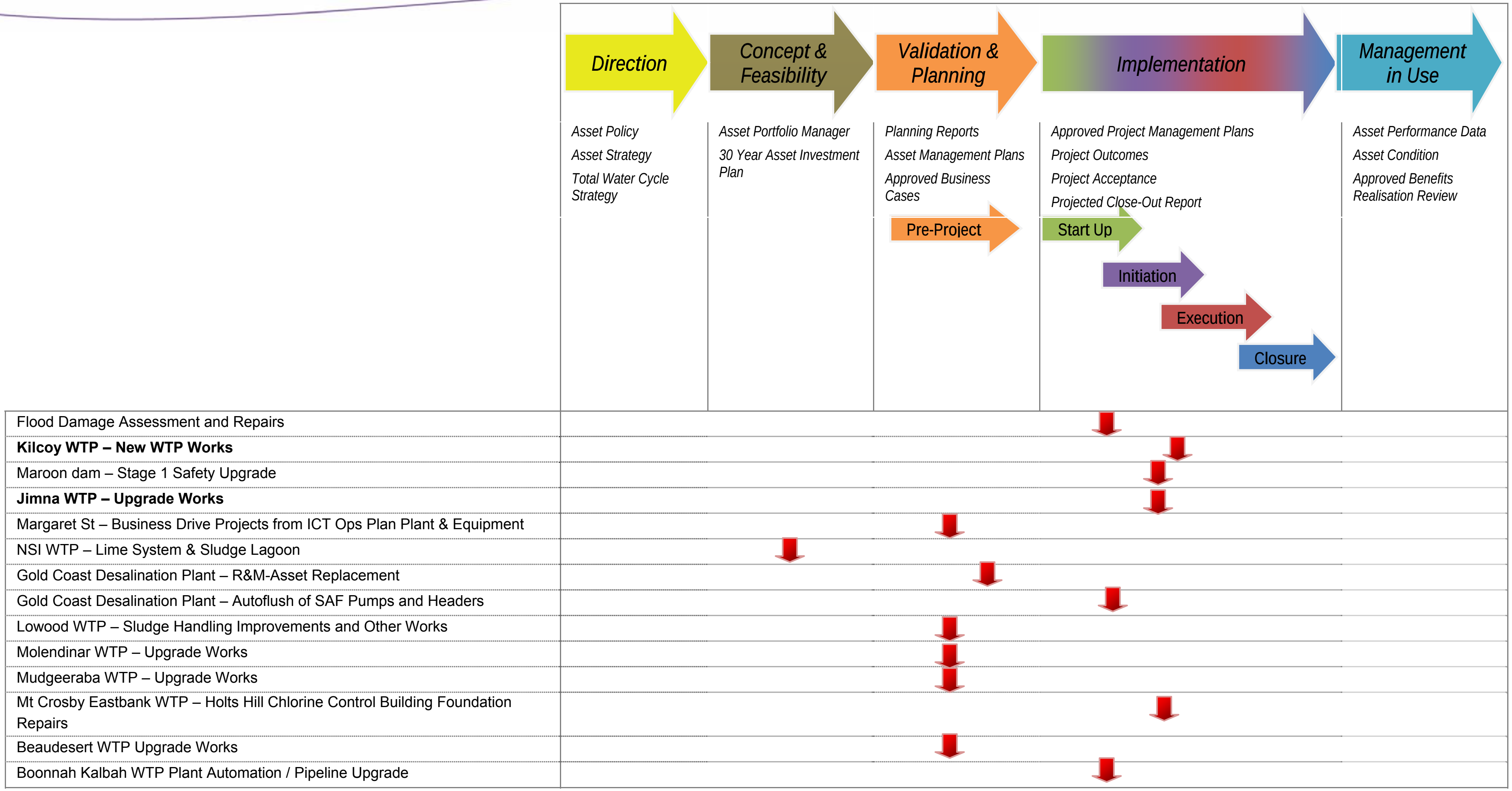


Figure 2 Status of 2012/13 projects within the Seqwater Delivery Framework

To facilitate a uniform understanding of the status of the project it is suggested that Seqwater advise their perspective of the status of the project with the submission of sample info.

4.5. Conclusions

The provision of information was reasonable. The inability to provide all relevant information has resulted in the review of some of the projects not being completed and consequently approval not being able to be provided.

5. Policy and procedure review

5.1. Capitalisation Policy

As part of this assignment, SKM was requested to review the Seqwater's policy on how it decides when a cost item is capitalised and when it is expensed. Seqwater provided to SKM a document marked "*draft*", titled "*Accounting Direction – Capital Works, Capital Vs Operating*". According to this policy, to be considered a capital work, the cost item must be an asset from which future economic benefits are expected to result. This would include increasing the capacity to provide goods and services in accordance with the Seqwater's objectives and include future revenue and non-revenue (service) potential. Besides enabling Seqwater to derive an economic benefit, the asset also needs to have a life of more than 12 months and have a cost or value that can be reliably measured.

5.1.1. Capitalisation

The capital cost of an asset includes its purchase price or direct construction costs and any other 'directly attributable' costs that are incurred in bringing the asset to a location and condition ready for use. Costs incurred in the initial estimation of the costs of dismantling and removing the item and restoring the site on which it is located are also included.

Replacement, renewed or refurbished components that increase the service potential or useful life of the assets beyond the originally assessed economic benefits are capitalised. Items that are replaced will be removed from the asset register.

Costs incurred to establish a project team to manage major specific capital works are capitalised. These costs are distinct from on-going maintenance costs which are regarded as operational costs. The project team costs are specific to a capital project. Where staff are dedicated to managing a number of capital works projects, a reasonable basis for allocating staff cost will be established.

Capitalisation of costs for a project begins at the forward design stage. Even though the costs incurred at this stage arise before final construction approval, Seqwater considers that at this stage, the project proceeding to construction is probable and therefore will provide future economic benefits. Costs incurred during this stage are 'directly attributable' in enabling the construction of the capital works project to proceed and thus all costs incurred in during this stage are capitalised.

Relocation may be necessary if an existing infrastructure is to be demolished and rebuilt. As this occurs immediately prior to the commencement of construction, Seqwater considers that the capital works project will probably be completed and provides future economic benefits. Removal costs and site preparation costs are seen as 'directly attributable' costs as without these costs, the capital works project could not proceed and these costs are capitalised.

The construction stage of the project begins with the tender process and the awarding of a contract for construction. Tendering costs, including consultant, travel and advertising costs, are capitalised as these will generate future economic benefits. All construction and fit-out costs to get the plant ready for use will be capitalised as these costs are required to be incurred to enable future economic benefits and are 'directly attributable' in bringing asset to a condition ready for use. Similarly costs incurred to correct defects are capitalised as they are required to bring the asset to the designed conditions.

5.1.2. Expensed operating costs

Once the asset is in place and in a condition where it is capable of being operated in the intended manner, capitalising of costs will cease. Subsequent operating costs are expensed. The costs incurred during normal operations do not increase the future economic benefits of any capital works project and are not 'directly attributable' to any capital project are expensed.

Certain costs incurred during the development of a capital asset are expensed. These are usually not directly attributable to the project even though they may be incurred in connection to the development of the asset. These would include the costs incurred relocating staff into a new building at the completion of the project. Also costs incurred in training, even though they may be incurred for specific capital works, are expensed as they are not specific to an asset.

Repairs and maintenance costs are incurred to maintain assets in their original state and are necessary to enable the continued use of the existing assets. Such projects do not increase the capacity or the asset or extend the economic life of the asset. Such projects do not provide future economic benefits and cost incurred are expensed.

Costs incurred in developing a project concept are not capitalised as there is little certainty that the project will proceed. Similarly costs incurred to undertake any feasibility study are also expensed.

During the construction of an asset, it may be necessary to incur costs to temporarily accommodate staff and materials. These costs are incurred during the course of ordinary operations and are not 'directly attributable' to the construction of the asset. They are expensed as part of the normal operating costs.

Similarly, general operation costs incurred during the defect period are expensed as part of normal operations.

5.1.3. Capitalisation Policy Summary

Table 8 provides a summary of Seqwater's capitalisation policy as it applies to new capital works including replacement of existing assets and capital upgrades. The accounting treatment appears reasonable and consistent with the applicable Australian Accounting Standards.

- **Table 8 Seqwater – Capitalisation Policy Summary**

Phase	Project Stage	Cost Item	Accounting Treatment
Phase 1 – Concept Development	Project Concept Brief	Staff costs: - Project Team - Everyday costs	 Expense Expense
Phase 2 – Feasibility Study	Feasibility Study (Needs Assessment)	Staff costs: - Project Team - Everyday costs	 Expense Expense

Phase	Project Stage	Cost Item	Accounting Treatment
		Consultant costs	Expense
		Travel costs	Expense
	Forward Design Proposal and Cost Benefit Analysis (both prepared using Feasibility Study results)	Staff costs:	
		- Project Team	Expense
		- Everyday costs	Expense
		Consultant costs	Expense
		Travel costs	Expense
Phase 3 – Forward Design	Engage Project Director/Manager	Staff costs:	
		- Project Team	Capitalise
		- Everyday costs	Expense
		Project Management costs	Capitalise
		Travel costs	Capitalise
	Produces the required design documents	Architectural/Design Consultant	Capitalise
		Quantity Surveyor costs	Capitalise
		Specialist Consultant costs	Capitalise
		Travel costs	Capitalise
	Design Acceptance	Staff costs:	
		- Project Team	Capitalise
		- Everyday costs	Expense
	Business Case Proposal	Staff costs:	
		- Project Team	Capitalise
		- Everyday costs	Expense
Phase 4 – Construction	Pre-construction Relocation (staff are moved to temporary accommodation)	Staff costs:	
		- Project Team	Capitalise
		- Everyday costs	Expense
		Removalist costs	Capitalise
		Rental costs	Expense
		Minor fit out costs	Expense
	Project Director/Manager goes out to tender for construction	Staff costs:	
		- Project Team	Capitalise
		- Everyday costs	Expense
		Procurement costs:	
		- Project Management	Capitalise
		Insurance costs	Capitalise
		Travel costs	Capitalise
	Project Director/Manager engages construction contractors	Staff costs:	
		- Project Team	Capitalise
		- Everyday costs	Expense
		Procurement costs:	
		- Project Management cost	Capitalise
		- Construction costs	Capitalise
	Project Manager selected for fit-out	Staff costs:	
		- Project Team	Capitalise
		- Everyday costs	Expense
		Procurement costs:	
		- Project Management cost	Capitalise
			Capitalise

Phase	Project Stage	Cost Item	Accounting Treatment
		- Construction costs	
	Purchase of fit-out items and installation of assets	Asset Purchase costs	Capitalise
		Fit-out costs	Capitalise
		Performance Testing Costs	Capitalise
Phase 5 – Practical Completion and Defect	Defect period commences after formal handover. Staff, through Project Director/Manager, ensure defects list is completed and defects fixed	Staff costs:	
		- Project Team	Capitalise
		- Everyday costs	Expense
		Procurement costs:	
		- Defect costs	Capitalise
Phase 6 – Post Construction Relocation	Moving into completed building (where applicable)	Staff costs:	
		- Project Team	Expense
		- Everyday costs	Expense
		Removalist costs	Expense
Phase 7 – Running Costs	There are costs that occur after project completion stage that will require funding	Depreciation	Expense
		Ongoing repairs & maintenance	Expense
		Other running costs	Expense
		Insurance	Expense
Whole of Project Costs	There are a number of costs that may be incurred during any phase of a capital work project	Training costs – all phases Meeting Costs – all phases Steering Committee costs – all phases	Expense Expense Expense

5.2. Budget formation

This section identifies our understanding of good industry practice for budget formation for capital expenditure and operating costs and compares the processes used by Seqwater to this practice.

5.2.1. Seqwater's budgeting process

Within it submission Seqwater states that it has developed its budget using a bottom up approach - where zero base budgets have been developed to estimate costs for the 2012/13 financial year.

Seqwater further states in its submission that the key underlying principles for development of the 2012/13 capital expenditure program included:

- reduction of the risk profile associated with dam upgrade projects
- continuing work to improve asset knowledge and focus investment on all assets with a view to reducing risk profile – across built and natural assets
- rationalising water treatment plant assets (and optimising catchments) through effective portfolio planning and influencing grid planning
- finalising flood repair works and associated insurance claims
- continuing to evaluate and integrate source, store and supply assets in portfolio planning and investment decision making

- maximising efficiency across source, store and supply assets
- continuing to target research to address catchment investment efficiency within the treatment process
- enhanced deliverables to include improved sustainable business outcomes

5.2.2. Good industry practice

The Authority has requested SKM to review Seqwater's procurement, asset performance, condition assessment and demand forecasting policies and procedures and assess whether these policies and procedures represent good industry practice.

Good industry practice for a water utility's policy and procedure would require, where appropriate:

- Demonstration of clear linkages with the organisation's corporate strategic plan, policy and objectives (eg in relation to water supply provision, demand forecasting, asset management etc)
- The use of master planning of its water system, including trunk infrastructure planning, preliminary infrastructure sizing, modelling and forward costing
- The use of a defined asset management system based on condition assessments and/ or risk profiles
- The consideration of relevant legislation and state-wide planning directions
- Clear strategic framework spelt out (strategic/tactical/operational objectives) for a particular issue of activity. For example, management of "critical water mains" to prevent failure.
- Definition and specification of the necessary and sufficient information requirements to assess asset/system performance against those objectives
- Asset/system performance assessment process
- Gaps identification (ie shortfalls in performance)
- Risk assessment framework defined
- Decision-making framework and prioritisation process specified, including "appetite for risk" (this should cover the asset class and/or classes being considered, but also be in context of how decisions are made in a broader organisational context)
- Options identification and evaluation process, including how the preferred option is selected (economic, triple bottom line/multiple criteria assessment, stakeholder input, other). Options assessments should consider the "do nothing" base case. Within the context of a water utility, the "do nothing" base case should describe the impact and consequences of not taking action. A multiple criteria assessment to ensure a triple bottom line approach for determining the recommended solutions should also be used. Using a standardised process to conduct this assessment will facilitate justification and prioritisation of a project over another.
- How the works and related expenditure projects and programs are determined from the options identification and evaluation process
- The identification of cost drivers to determine whether a project is adequately justified and therefore prudent

- The documentation of the project/program selection and prioritisation, through close-out reports and approvals gateways
- Specification of performance evaluation measures for the project on implementation
- Feedback loops
- The production of adequate documentation and reporting for each process, approvals within a project management and delivery framework

A good governance process should address and document:

- The identification of specific project drivers
- Options likely to address the drivers
- How the recommended option was selected
- The approved project cost and its basis
- The evaluation of economic, technical, environmental and regulatory tests
- Risks and how they are to be managed
- Critical success factors for the project
- The approval process
- The implementation process
- The project performance and evaluation – what went well, what can be learned from the performance, and whether the critical success factors were addressed
- The comparison of the actual, as-built cost with the original estimate upon which approval was sought and how that would have impacted the merit order of options considered

5.2.3. Good industry practice for capital budgeting

The following outlines what we consider to be good industry practice in capital expenditure budgeting for regulated utilities. Most utilities use two basic forecasting approaches to develop capital expenditure and operating costs budget forecasts for their regulated businesses.

The first approach – "base year" forecast – involves extrapolating historical expenditure for a particular expenditure category. It generally requires justification that the base year expenditure is reasonable and efficient and that any one-off costs that would not be expected to apply in future years are identified and excluded from forecasts.

The second approach –"bottom-up" forecast – is developed by forecasting work units or quantities and standard unit rates. This type of forecast should be supported by explanation and justification of the work units forecast and that the unit rates proposed are reasonable and efficient.

It is not uncommon for a utility to use both of these approaches, with operating costs forecasts primarily driven by a base year extrapolation and capital expenditure forecasts by a bottom up approach, on a project-by-project basis.

Capital project budgeting

Capital project spend in a regulated business is required to be assessed against standard criteria of prudency and efficiency. That is, the following questions have to be answerable in the affirmative for any given project:

- Is the project needed for the regulated industry to deliver the level of service required in the future and is the timing of the project prudent?
- Is the cost reasonable (within industry norms) for such a project?

An underpinning tenet of an organisation's ability to demonstrate that its capital project expenditure programme is prudent and efficient is a good governance process for capital expenditure approvals.

We believe that good industry practice for the development of a capital projects budgets includes the following:

- The identification of projects which meet the requirements of prudency and efficiency
- Project prioritisation, including prioritisation across programs of work
- Consideration of the timing of projects and the ability to deliver the capital program
- A defined review and approvals process, including documentation of this process

In respect of supporting documentation required to gain approval for capital expenditure for a given capital project, we believe good industry practice should include:

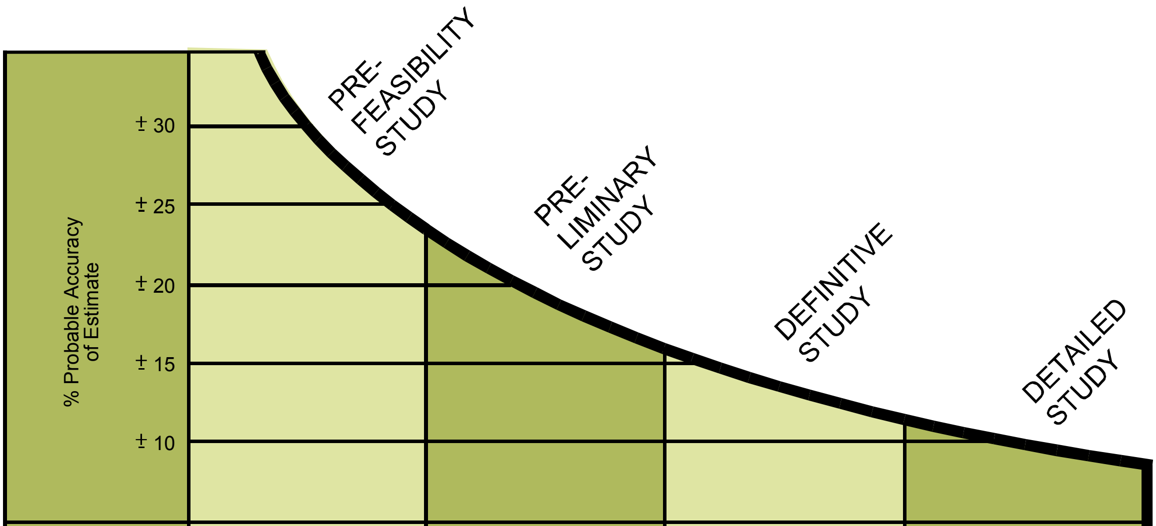
- A phased process, starting with a project outline, through to defined requirements for business cases and final approvals
- A tiered structure, with differentiated requirements and degrees of documentation and review for projects depending on their cost
- Fully supported capital expenditure approval documentation incorporating:
    - The project background/rationale
    - The project drivers, including reference to the Authority's drivers
    - The options reviewed to address the drivers, including the method of selecting the preferred option
    - Fully costed and financially evaluated option studies, including a "do nothing" option, preferably on a present value, or, if appropriate, a net present value basis
    - Where capital is constrained, explanation of why a project is proposed over others that may adhere to the above requirements
    - A defined scope of works for the preferred option
    - The identification of project risks and how they will be managed
    - A breakdown of the approved project cost and the basis of this cost estimate, including defined cost estimating procedures, including the treatment of contingencies
    - The critical success factors of the project

  - An implementation plan

For historic projects, the process should address:

- How the project was implemented
- How the project performed – successes and lessons learned
- How the project addressed the original need
- How the project addressed the critical success factors
- How the as-built cost compared with the original estimate
- If the as-built cost of the project changed the order of merit of the options considered at the options analysis stage

The level of supporting documentation will be dictated by the project size, project cost and the respective sign-off authority level within an organisation. The chart below illustrates the kind of detail we believe should be presented, and notes that the estimates used for many projects can be expected to have uncertainty of 30% or more.



Type of Estimate	Order of Magnitude	Preliminary	Definitive	Detailed
Provided Documentation	• Product capacity and Location • Cost Data on Similar Projects • Major Equipment List	• Preliminary Equipment List • Engineering Line Diagram • Plant Outline General Arrangement • Maps and Surveys • Bench Test Results • Nature of Facilities	• Equipment Specifications and Vendor Quotations • Construction Schedule • Electrical One Lines • Piping and Instrumentation Flow Diagrams • Soil Data and Architect Features • Site Survey and Labour Complete	• Bulk Material Specifications and Vendor Quotes • Construction Specification and Sub Contractor Quotations • Engineering Advanced Approximately 10%
Definition of Scope of Work	Conceptual	Approximate	Clearly Described Essentially Complete	Complete. Well Detailed
Estimating Procedure	Factoring	Combination of Factoring and Quantity Take-Off	Most Quantity Take-Off. Very little Factoring	Complete Quantity Take-Off
Use of Study	Comparison/ Rejection	Final Feasibility	Budget	Funding

Figure 3 Typical estimation accuracies and expected documentation

In addition, the overall capital expenditure programme should be weighted equally through the respective regulatory periods. This strategy maintains steady and reliable stream of work for construction contractors and reduces the price impacts of the substantial capital works programmes during earlier years of the regulatory period.

5.2.4. Comparison of Seqwater's budgeting process with good industry practice

The intent of Seqwater's budgetary process is similar to good industry practice, however there are opportunities for improvement. These include the development of concise sections within standard reports that address the basic questions of need and cost driver, options assessment and cost estimates with standardised accuracy envelopes and contingency, relevant to the phase of the project. This is anticipated to be of interest to the Board and Regulator.

In addition, after the receipt of strategic grid directions the development of a plan that informs prioritisation of works would be useful.

5.3. Strategic development plans

Seqwater have not developed strategic development plans as no direction has been given by the SEQ Water Grid Manager. Seqwater relies on the plans and frameworks developed as part of its asset management system.

Seqwater have an Asset Portfolio Master Plan (APMP) and a 30 Year Asset Portfolio Investment Plan (APIP). The APMP takes a 30 year view with regard to catchment based assets and provides the criteria used to determine asset investment prioritisation. The master planning process is a consultative process, which engages internal and external stakeholders to understand business drivers and verify the optimum Grid and business response, and identify options for major changes to the attributes of Seqwater's catchment assets which may be required. These plans are then validated and implemented through the production of Options Studies and Business Cases.

5.4. Risk and asset management planning

5.4.1. Asset management approach

Seqwater's asset management function is broad and encompasses the entire lifecycle of physical assets, from direction setting, to management in use, to disposal, as well as considering the broader direction and long term planning of its asset portfolio.

Seqwater manages a complex asset portfolio, comprising a range of natural and built assets of varying asset types, ages, sizes, geographic dispersion and condition accompanied by varying degrees of asset information and knowledge. Seqwater recognises that its effectiveness as a business is underpinned by its understanding and management of its assets.

Seqwater inherited over 43 water treatment plants of various capacity and condition, 22 major dams, three advanced water treatment plants and one desalination plant. On transfer, the condition of these assets and management practices differed widely. In most cases, the standard of management practices, regulatory compliance and reporting were carried out under less stringent governance and regulatory arrangements than are currently applicable. Whilst physical assets were transferred to Seqwater, there was very little transfer of water and catchment condition information for the water treatment plants and dams. In most cases, this was due to inadequate monitoring, whilst in a minority of cases, Seqwater indicates that the knowledge was not in a transferrable form. To rectify this shortcoming, Seqwater is undertaking a three-year process to identify catchment condition and assess risks across all catchments.

5.4.2. Asset management framework

Seqwater commenced development of an overarching Asset Management Framework to manage its assets in 2010/11, below in **Figure 4**. It aims to facilitate improved integration, planning and management of natural and built assets and to align with the delivery of Seqwater's Strategic Plan and attain successful performance in asset management by achieving:

- uniform organisational processes in asset management
- prudent asset investment decision-making
- a balanced approach to investment across our catchments
- standardising processes for successful asset management (including project delivery)
- delivering efficient outcomes and value for money

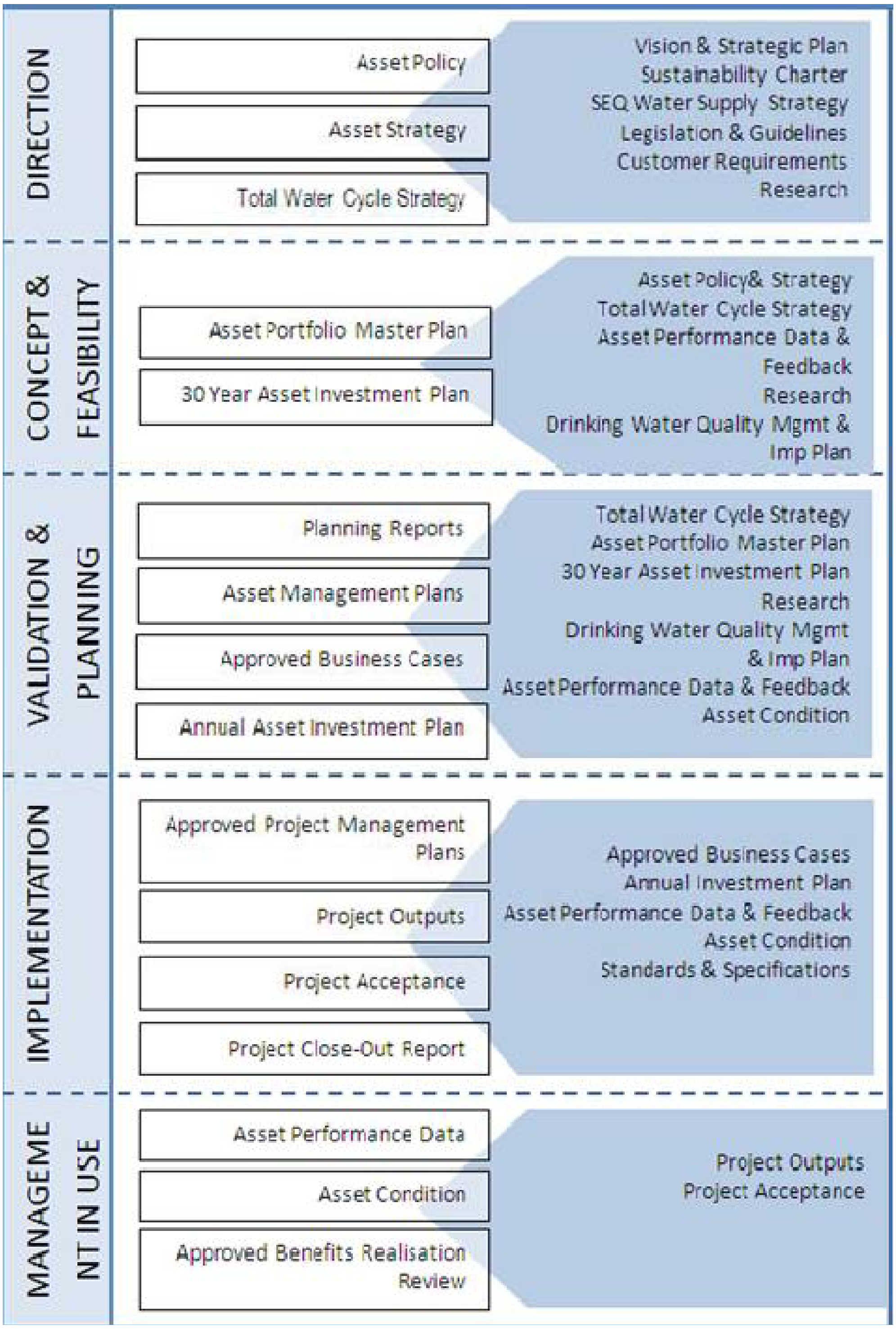


Figure 4 Seqwater's Asset Management Framework overview

The framework incorporates five phases:

- Direction
- Concept and feasibility
- Validation and planning

- Implementation
- Management in use

The ‘delivery’ version of the Asset Management Framework is indicated in **Figure 5**.

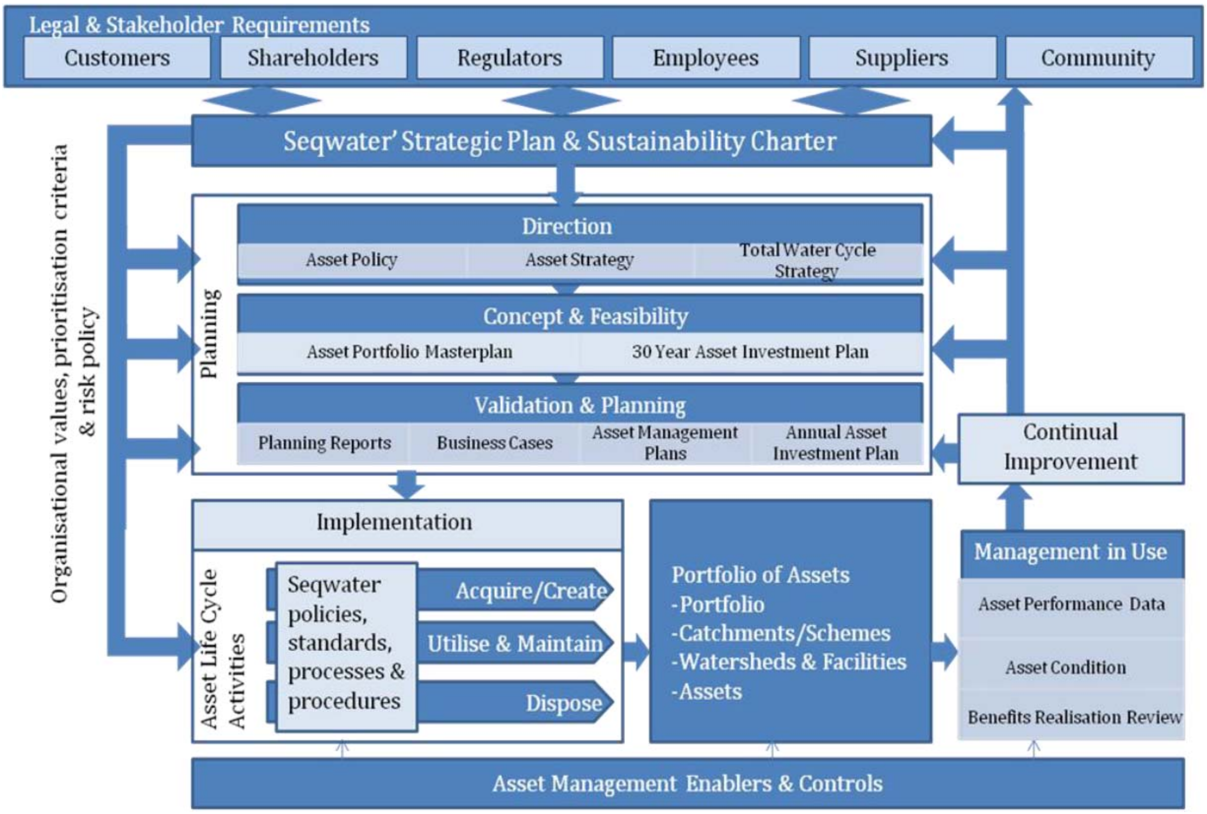


Figure 5 Seqwater’s Asset Management Framework (Delivery)

During 2011/12, Seqwater undertook an internal benchmarking exercise of reviewing its functions and the scope and content of the asset management policies, strategies and procedures it is developing under the Asset Management Framework against accepted asset management industry best practice. The International Infrastructure Management Manual (IIMM) (IPWEA, 2006) and the UK Publically Available Specification - the Optimized Management of Physical Assets – No. 55 (PAS-55) (IAM, 2008) are widely accepted best practice industry guides for asset intensive organisations, such as Seqwater, in developing and implementing asset management frameworks and best practice asset planning and management practices. The IIMM’s approach and scope for development and implementation of an Asset Management Plan was used to ensure the scope and content of the policies, strategies and procedures being developed by Seqwater would deliver a mature and comprehensive asset management framework.

Seqwater indicates that the development and implementation of the Asset Management Framework will:

- *“address development of a complete and accurate Asset Register of all assets and capture of all critical asset information;*

- *in consideration of Seqwater "s Grid Contract and the Grid Operating Protocols, confirm what levels of service (performance standards) existing assets are required to sustain over their predicted residual lives to meet SEQ growth demands as determined by the Queensland Water Commission;*
- *conduct an asset condition assessment (to a basic level) of all assets and a detailed condition, risk and criticality assessment of identified critical assets;*
- *determine the condition and performance based residual lives of all assets in order to determine the lifecycle and renewal costs of the asset portfolio;*
- *undertake asset risk and criticality assessments to determine which assets pose the greatest business risks with asset failure for a prioritised, more detailed assessment;*
- *optimise the operation and maintenance regimes for both critical and non-critical assets (where opportune) to minimise overall business risk to asset failure;*
- *plan asset investment, renewal and disposal solutions, focussing on priority assets and others when appropriate, to meet Grid Contract obligations and level of service requirements (performance standards); and*
- *determine and maintain a prudent 30-year forecast of asset investment and operational funding requirements - reviewed each year as Seqwater improves its knowledge of its assets."*

5.4.3. SKM's assessment

Seqwater has made progress in developing robust asset management processes and procedures for comprehensive asset information. While Seqwater may not currently have good asset condition information due to its recent formation and the lack of condition information transferred from previous owners/operators, we consider that the plans and processes it has adopted to assess the condition of its assets will rectify this situation if carried through.

5.5. Corporate directives

Seqwater has adopted the following objectives of corporate governance which are based on those set out in the *AS 8000-2003 - Good Governance Principles* (the Australian Governance Standard):

- enhance organisational performance
- understand and manage risks to minimise the negative aspects and maximise the opportunities
- strengthen shareholder and/or community confidence in an entity
- enhance the public reputation of an entity through enhanced transparency and accountability
- allow Seqwater to demonstrate how they are discharging their legal, shareholder and ethical obligations
- provide a mechanism for benchmarking accountability
- assist in the prevention and detection of fraudulent, dishonest and/or unethical behaviour

Seqwater has adopted the following principles of corporate governance which are set out in the *State Water Authorities Governance Framework*. These principles are as follows:

- lay solid foundations for management and oversight
- structure the Board to add value

- promote ethical and responsible decision making
- safeguard integrity in financial reporting
- make timely and balanced disclosure
- respect the rights of shareholders
- recognise and manage risk
- remunerate fairly and responsibly

The 2010-11 to 2014-15 Strategic Plan summarises Seqwater's vision, values, goals, business drivers and key corporate expectations. Seqwater vision is 'Water for life – vibrant, sustainable and optimistic urban and rural communities and businesses'.

Seqwater's mission statement is '*Seqwater provides innovative and efficient management of both natural and built catchments, water storages, and treatment services to ensure the quantity and quality of water supplies'*.

Seqwater's goals are:

1) Water supply quality and security - provide urban consumers with reliable water of a quality that meets or exceeds the Australian Drinking Water Guidelines (ADWG) as required by regulation, contract and best practice
2) Catchment sustainability - effectively research and manage the water catchments to maximise water quality while also providing for flood mitigation, fostering rural productivity, providing places of recreation, enhancing biodiversity and providing amenity for the people of SEQ

5.6. External drivers

5.6.1. Demand forecasting

The SEQ Water Grid Manager is responsible for forecasting short and medium term water demand through collating monthly and annual forecasts from the retail water businesses. For short term forecasting each month, these water retail entities and major water customers (eg power stations) provide forecasts of their water demand for the 12 months ahead. Seqwater provides a Grid Service Provider Forecast Notice stating its water in storage and its expected treatment capacity. The SEQ Water Grid Manager then issues grid instructions to Seqwater and other grid service providers in relation to meeting these demands.

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 before the period covered by the grid instruction begins.

The Market Rules specify that the production at any Seqwater facility be within +/- 20 per cent 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 undesirable outcomes. The Market Rules also provide a mechanism for excusing non-compliance in some circumstances, provided notification (an “Inability to Comply”) is provided to the SEQ Water Grid Manager. This notice is required irrespective of the driver for the supply being outside of the +/- 20 per cent margin, ie notice is required if:

- The forecast demand by the SEQ 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 offline
- Unplanned maintenance must be undertaken on a treatment plant

The Market Rules also make provision for LinkWater and the retail distribution entities to provide operating instructions to Seqwater to give effect to the grid instructions. There are similar provisions as there are for grid instructions for the amendment of operating instructions or for notifications where compliance with the operating instructions is not possible. Operating protocols have been developed for each of the interface points between Seqwater and the other GSP, LinkWater.

In many cases, the grid instructions from the SEQ Water Grid Manager specify that production should be “as required to meet demand”. The SEQ Water Grid Manager has advised that this applies where there “is a direct connection to the customer’s infrastructure, and therefore, system’s demand” i.e. the customer’s demand represents the system’s demand in this case.

In most cases, Seqwater has few operational choices in what source to use and how much water to draw from these sources 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.

The Queensland Water Commission or the SEQ Grid Manager may direct Seqwater to undertake projects to expand its supply capacity to meet growth in demand as they are responsible for determining the least cost augmentation solution. Seqwater states this it is unlikely to undertake any augmentation to increase supply without such a direction.

For medium term forecasts, the SEQ Water Grid Manager uses a combination of the Retail Distribution entity Netserv plan forecasts, the Queensland Water Commission long term planning forecasts as well as historical Grid consumption patterns to assist with operating strategies, Grid optimisation and service specification.

5.6.1.1. SKM’s assessment

Seqwater does not have nor does it require a demand forecasting policy or process. It operates under the demand forecast provided to it by the SEQ Water Grid Manager. Capital investments decisions are not undertaken independently of the SEQ Water Grid Manager and/or Queensland Water Commission who are responsible for issuing capacity expansion instructions to Seqwater, based on their projections for water demand.

5.6.2. Standards of service review

Seqwater’s operating obligations are contained in the following legislative instruments:

- *Water Act 2000*
- *Water Supply (Safety and Reliability) Act 2008*
- *South-East Queensland Water (Restructuring) Act 2007*
- The Market Rules: SEQ Water Market
- South East Queensland Water Grid: Grid Contract Document
- SEQ Water Grid Quality Management Plan
- SEQ Water Grid Operating Strategy
- Grid Instructions
- Regulatory licences

In addition to legislative requirements, there are several other planning documents and guidelines, which need to be taken into account:

- South East Queensland Regional Plan 2009-2031
- South East Queensland Water Strategy
- South East Queensland System Operating Plan

The Australian Drinking Water Guidelines (ADWG) set out the framework for best practice management of drinking water. These guidelines are central to the regulatory and contractual obligations of grid service providers, including Seqwater. The ADWG guidelines have been incorporated into Seqwater’s statutory instrument, the grid contract, We understand that under clause 10.2 of Seqwater’s Grid contract, Seqwater must ensure that all potable water made available at water supply points under the contract is ‘*fit for human consumption and meets the Quality Requirements*’.

‘Quality requirements’ are defined under the contract to mean any legislative requirements and ‘in respect of potable water, the ADWG specifications’. The obligation is therefore on Seqwater to meet, and effectively comply with, the requirements of the ADWG. The reference to ‘specifications’ requires the compliance encompasses the guideline as a whole. Non-compliance with clause 10.2 of the Grid Contract would be a breach of the contract.

All the major facilities and schemes operated by Seqwater produce water that is covered by explicit contractual conditions. Seqwater’s current service standards for bulk water supply are specified by the conditions of the grid contract with the SEQ Water Grid Manager.

Seqwater has a general obligation to operate its assets in accordance with good operating practice, as defined in the Market Rules. This includes taking reasonable steps to ensure that plant and equipment is operated in a way that is safe to workers and the public, does not unnecessarily damage the environment and does not cause damage to plant and equipment above normal wear and tear.

The Market Rules also require Seqwater to develop operating protocols and submit these to the SEQ Water Grid Manager for approval, including:

- Management of peak daily demand, flow rates and pressure
- Maintenance and asset reliability
- Water quality indicators associated with maintaining the operation of assets and equipment
- Notification requirements for changes in water quality
- Operation of manual and automated system control processes

Seqwater must also comply with operating protocols under the Market Rules which were agreed among grid participants and approved by the SEQ Water Grid Manager.

5.6.3. SKM's assessment

There are sufficient requirements in Seqwater's contracts and protocols to oblige it to develop appropriate performance standards and to meet the requirements of these performance standards.

Seqwater does not currently have its own standards of service in place. Seqwater has established a number of internal KPIs as indicators of performance for management and improvement purposes. KPIs have been established to monitor and report on progress towards these standards, including:

- Source and off-take water quality standards
- Supply quantity and quality
- Infrastructure condition and capability

SKM recommends that Seqwater specify the probability of treatment plant capacity availability.

5.7. Procurement

In response to our request for its procurement policies and practices, Seqwater provided three documents – Procurement Policy, Procurement Handbook and Procurement Supply Procedures. These document Seqwater's formal policy and procedures for procurement.

5.7.1. Procurement policy

The Procurement Policy has been prepared to encourage best practice in procurement. It aims to assist staff involved in the procurement process to focus on the business outcomes required by Seqwater and to comply with relevant Acts and Standards. The key objectives of the policy are to:

- Achieve value for money
- Ensure probity and accountability for outcomes
- Advance government priorities in procurement

Seqwater's procurement policy seeks to achieve these objectives through applying the following principles:

- A planned approach to all procurement whereby savings and synergies will be realised through effective planning, clarity of scope, a longer term outlook, managing demand and negotiating value for money outcomes
- Create flexibility in our process through well considered procurement strategies and market research
- Communicate in an open and effective manner by engaging early and often with stakeholders, taking a cross-organisational perspective and engaging the supply market through defined scopes and measurable deliverables
- Ensure probity and ethical conduct in all procurement activities
- Ensure that the level of procurement effort is commensurate with levels of risk and criticality
- Make commercial decisions which align with business strategies and reflect value for money whilst promoting socially responsible, safe and sustainable procurement
- Provide governance over Seqwater procurement outcomes through appropriate oversight of procurement activities

5.7.2. Procurement procedure

The Procurement Handbook provides guidelines for obtaining goods, services and assets and is designed to support the objectives of the Procurement Policy. The procurement process involves five major process steps:

- Planning
- Tendering
- Purchasing
- Contract Management
- Logistics

It provides thresholds in approvals required for procurement of goods and service where contracts with values:

- Between $ 20,000 and $ 100,000 requires written approval, eg email, from the Manager
- Between $ 100,000 and $ 500,000 requires a memo signed by the EGM
- Between $ 500,000 and $2 million required a Business Case signed by the CEO
- Greater than $2 million required a Business Case presented to the Board signed, with Board approval

According to the 'Procurement Decision Making Matrix', in the Procurement Handbook, the thresholds in approaching the market for procurement of goods and service where contracts with values:

- Panel arrangements -
  - Tiered Panel arrangement -

        - Less than $ 500,000 may be obtained from one supplier
        - Greater than $ 500,000 need to develop a Sourcing Strategy
    - Standard Panel arrangement -
        - Less than $ 100,000 may be obtained from one supplier
        - Between $ 100,000 and $ 500,000 need to develop a Request for Quote (RFQ) – minimum three quotes
        - Greater than $ 500,000 need to develop a Sourcing Strategy
- Contract arrangement -
    - Less than $ 500,000 may be obtained from one supplier
    - Greater than $ 500,000 need to develop a Sourcing Strategy
- No arrangement -
    - Less than $ 20,000 may be obtained from one supplier
    - Between $ 20,000 and $ 100,000 need to develop a Request for Quote (RFQ) – minimum three quotes
    - Greater than $ 100,000 need to develop a Sourcing Strategy
- Construction -
    - Less than $ 500,000 need to develop a Minor Works RFQ
    - Greater than $ 500,000 need to develop a Sourcing Strategy

A waiver of the procurement process may be sought when:

- A genuine urgent requirement exists
- A recognised specialist or leading authority in a particular field is required
- A sole supplier situation exists

In such cases, Seqwater's CEO must approve use of this sole supplier.

The decision on whether the tender will be an open or closed tender must be reviewed and approved by an Executive General Manager. Tenders may be conducted when Seqwater wishes to appoint a panel of suppliers or when a project manager, in conjunction with the Contracts Procurement team, determines a need to go to tender. The project manager and Contracts Procurement team will recommend whether the tender will be open or closed. This decision must be approved by the Executive General Manager. Seqwater provides several types of contracts. Executive General Managers may sign contracts up to $ 100,000, while the CEO can sign contracts up to $ 500,000. Contracts over $ 500,000 must have Board approval.

The Procurement Handbook states that as a general rule a minimum of 12 weeks should be allowed for simple tenders and up to 16 weeks (or more) for complex, higher risk tenders. Once the tender process has closed, the proposals are evaluated according to the evaluation plan, with the procurement committee playing a probity role. Weighting/gating criteria are applied on a project by project basis.

An evaluation and recommendation report is presented to the procurement committee for approval, recommending a proposal.

The project manager is responsible for the administration and supervision of goods delivered or services provided under a contract and for ensuring that, before the commencement of any work under the contract, the supplier fulfils its obligations to Seqwater by complying with any requirements in relation to the Workplace Health and Safety Act.

To ensure that Seqwater is receiving good service and value for money through its contracts, the project manager is responsible for monitoring and inspecting the work undertaken or goods delivered for conformity with the contract. When requested, the project manager will be required to complete and provide an evaluation of the supplier to the Contracts Procurement team.

Procurement methods for large projects exceeding $ 2 million include:

- Design and construct
- Build Own Operate and Transfer (BOOT) delivery
- Alliances
- Standard tenders and contracts

The flexibility to use various approaches allows Seqwater to accommodate a range of project types, and is consistent with industry practices. Seqwater is developing a formal process to determine optimal procurement strategies for major projects or those for which efficiencies of scale may be leveraged.

5.7.3. SKM's assessment

While Seqwater's procurement policies and procedures do not provide for sustainable purchasing per se, its requirement to adhere to State Procurement Policy does require it to integrate sustainability into the procurement of goods, services and construction.

A further concern that we have is the arrangement for sole sourcing from tender panels. The relatively high limit of up to $100,000 of such single source purchases with limited required review from supervisory managers could allow misuse. It may be prudent for further limits to be placed on such an arrangement.

5.8. Cost allocation

Seqwater reports overhead costs separately and does not allocate overhead costs to assets or asset groups. Seqwater's accounting system captures direct operating costs for each responsibility centre and, for the production-related ones, costs these and production overhead costs to the relevant production function. Seqwater's accounting policies and practices do not involve allocating indirect costs (such as corporate costs, overheads or centralised technical and operational functions) to assets or activities.

SKM understands that while most of Seqwater's revenue is obtained from the supply of bulk water services, a small percentage of revenue does come from other sources. At present Seqwater has not allocated any of its overhead costs to these other sources of revenue. The Authority has at present agreed to this arrangement however noting that in the forthcoming review of irrigation prices the allocation of overhead costs will be taken into consideration and Seqwater is in the process of developing cost allocation proposals for this forthcoming review of irrigation prices.

Seqwater does not currently allocate FTEs to assets or allocate corporate costs to assets and as such was unable to provide this information. Seqwater discussed the issue of cost allocation in its 2011/12 Grid Service Charges Submission[2], which states:

> *"The QWC has previously not allocated costs to various non-regulated activities on the basis that these activities are relatively minor. Seqwater has continued this approach for 2011-12.*
>
> *Nonetheless, Seqwater anticipates that further work may be required for allocating these costs within the organisation as it implements its broader cost allocation approach as part of the implementation of its financial system."*

5.8.1. SKM's assessment

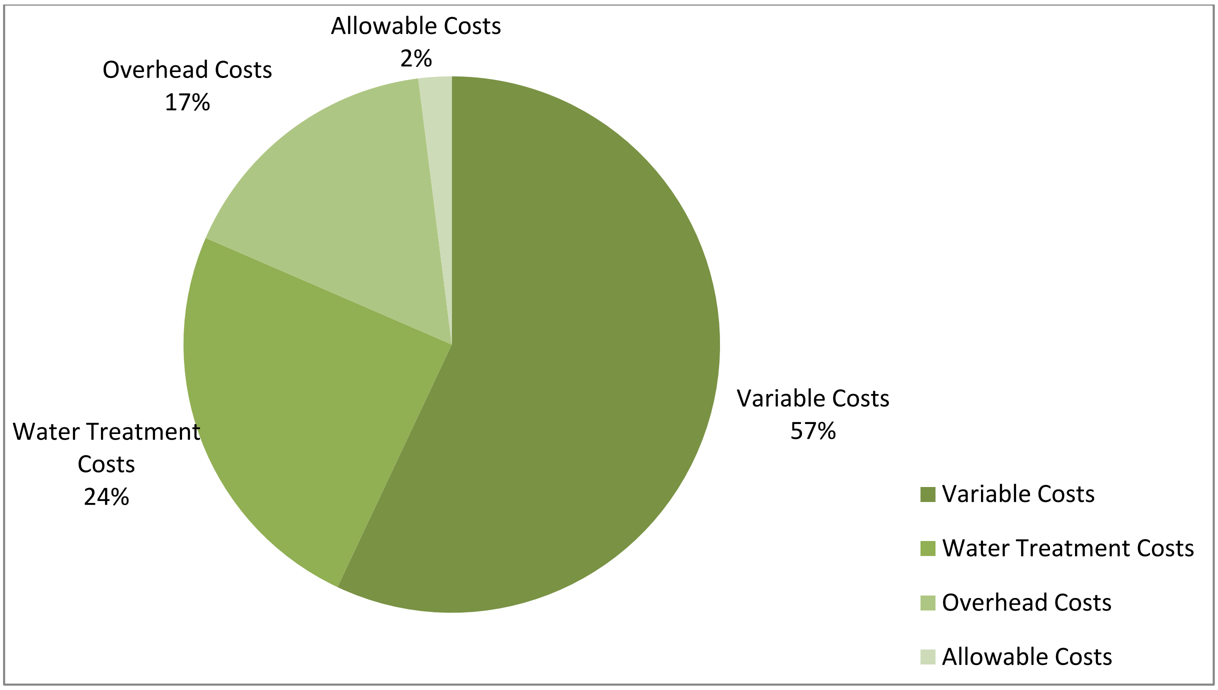
SKM suggest that there would be merit in the Authority agreeing with Seqwater, and LinkWater, the data to be captured and mechanism for apportionment of costs to allow assessment of cost allocation

[2] Seqwater 2011-12 Grid Service Charges Submission to the Queensland Competition Authority: Business and Regulatory Issues, March 2011

6. Operational expenditure

6.1. Overview of operating expenditure

Seqwater's proposed operating costs for 2012/13 comprises variable operating costs of $ 39 million, fixed water treatment costs of $ 141 million and total overhead costs of $ 95 million. In addition, the Queensland Water Commission levy of some $ 10.6 million is expected. The proportionate breakdown of the operating expenditure is shown in **Figure 6**. The major portion of operating costs incurred by Seqwater is classified as fixed costs. Fixed water treatment costs account for almost half and fixed overhead costs another third of its operating expenditure.



▪ **Figure 6 Seqwater – 2012/13 operating expenditure**

Variable operating costs include $ 18.7 million for energy required to operate the water pumping facilities, $ 17 million for chemical, and $ 2 million for sludge and other variable costs. In addition to the fix costs for operating the Western Corridor Recycled Water Scheme and the Gold Coast Desalination Plant, (accounted for under water treatment costs) for services rendered, Seqwater is also required to pay Veolia a variable cost margin. This is expected to cost in 2012/13 some $ 1.7 million.

As can be seen in **Table 9**, Seqwater's overall operating expenditure is forecast to increase by around 10% in nominal terms relatively to 2011/12. All components of the variable costs are expected to increase substantially, while smaller increases are also expected in the fixed cost components. Some of the movements may be explained by changes in the way costs have been categorised. The 2012/13 fixed costs include certain items previously considered allowable costs (for example, the Queensland Competition Authority fee) or variable costs (some energy costs are now re-classified as fixed rather than variable). The Queensland Water Commission levy[3] continues to be applied as an allowable cost item.

- **Table 9 Seqwater – Operating expenditure**

Source	2011/12 ($)	2012/13 ($)	% increase
Variable Cost			
Energy Cost	15,443,083	18,713,643	21.2%
Chemicals	13,009,007	16,939,306	30.2%
Sludge & Other Variable Costs	1,214,642	2,002,067	64.8%
[redacted]			
Total Variable Cost	**29,666,733**	[redacted]	[redacted]
Fixed Cost			
Water Treatment Cost			
Technical Warranty & Development	59,203,297	53,345,987	-9.9%
Water Delivery	74,086,361	87,501,483	18.1%
Total Water Treatment Cost	**133,289,658**	**140,847,470**	**5.7%**
Overhead Cost			
Asset Delivery	26,218,305	33,119,851	26.3%
Business Services	43,661,947	46,246,644	5.9%
CEO Office	5,966,701	1,669,139	-72.0%
Organisational Development	13,058,085	14,151,063	8.4%
Total Overhead Cost	**88,905,039**	**95,186,697**	**7.1%**
Allowable Cost (QWC & 2011/12 QCA Levy)	7,805,082	10,587,225	35.6%
Total Fixed cost	**229,999,779**	**246,621,391**	**7.2%**
Total Opex	**259,666,512**	[redacted]	[redacted]

While the Seqwater written submission did not provide a comparable breakdown of the 2011/12 operating costs, Seqwater did provide a consolidated operational cost spreadsheet that provided details of the 2011/12 costs together with equivalent the 2012/13 costs. The data in **Table 9** is based on the consolidated cost spreadsheet.

For consistency in comparison, the fixed operating costs include the fixed operating costs of all assets providing grid services, as well as recreation facilities and the full costs to supply irrigation services in all water supply schemes on the basis that irrigation and other revenues are offset against GSCs.

6.1.1. Sample selection

In this review, SKM in conjunction with the Authority has identified a number of operating expenditure items for closer scrutiny. A total of 15 operating expenditure items were identified

[3] There however appears to be some discrepancies regarding the 2011/12 QWC levy from the various sources of the Seqwater submission. On page 198 of its submission, Figure 12.2 details the 2011/12 allowable cost components. It includes QWC levies of $5.2 million for both WaterSecure as well as Seqwater, giving a total of $10.4 million for the cost item. Seqwater also states, in page 207 of its submission, that it has yet to obtain formal advice of the QWC levy for 2012/13, and proposes an amount of $10.587 million, based on an assumed 2.5% increase to the 2011-12 levy. This implies that the 2011/12 levy amount is 10.329 million. In the consolidated cost spreadsheet however, the cost of the QWC levy for 2011/12 is stated as $6.5 Million.

accounting for $ 37.8 million, 13.2% of Seqwater's total operating expenditure. **Table 10** shows the selected operating expenditure items and their values.

Table 10 Seqwater Sample Selection

Operating Expenditure item		Asset	Value $000s (2012/13)
1	Catchment Management & Maintenance - Salaries and Wages - Awards + Repairs & Maintenance	Wivenhoe Dam	746
2	Dam and Source Ops - Employee costs	North Pine Dam	342
3	Employee Expenses	Bundamba AWTP	2,419
4	People and Culture	Corporate Costs	4,350
5	Electricity	Mt Crosby Eastbank WTP	2,503
6	Treatment Chemicals	Landers Shute WTP	1,315
7	Electricity	Luggage Point AWTP	1,652
8	Repairs & Maintenance	Gold Coast Desalination Plant	5,167
9	Repairs & Maintenance	Pipeline Network	2,997
10	ICT Services	Corporate Costs	12,871
11	Repairs & Maintenance	Molendinar WTP	1,289
12	Infrastructure Maintenance - Planned	North Pine WTP	628
13	Infrastructure Maintenance - Scheduled	Mt Crosby Westbank WTP	508
14	Catchment Management & Maintenance - Repairs & Maintenance	Hinze Dam	491
15	Water Quality Monitoring	Gold Coast Desalination Plant	520

6.2. Overview of prudency and efficiency

Table 11 shows an overview of the final assessment made for each project of the 2012/13 expenditure items chosen for assessment of prudency and efficiency. A full summary with recommendations for each project can be found in the following sections of this report.

Table 11 Overview of prudency and efficiency of operational expenditure sample selection

Operating Expenditure item		Asset	Value $000s (2012/13)	Prudent	Efficient
1	Catchment Management & Maintenance - Salaries and Wages - Awards + Repairs & Maintenance	Wivenhoe Dam	746	Prudent	Efficient
2	Dam and Source Ops - Employee costs	North Pine Dam	342	Prudent	Efficient
3	Employee Expenses	Bundamba AWTP	2,419	Prudent	Insufficient information to assess all expenditure as efficient
4	People and Culture	Corporate Costs	4,350	Prudent	Expenditure efficient

	Operating Expenditure item	Asset	Value $000s (2012/13)	Prudent	Efficient
					except recruitment fees
5	Electricity	Mt Crosby Eastbank WTP	2,503	Prudent	Efficient
6	Treatment Chemicals	Landers Shute WTP	1,315	Prudent	Efficient
7	Electricity	Luggage Point AWTP	1,652	Prudent	Efficient
8	Repairs & Maintenance	Gold Coast Desalination Plant	5,167	Prudent	Efficient
9	Repairs & Maintenance	Pipeline Network	2,997	Prudent	Partially efficient
10	ICT Services	Corporate Costs	12,871	Prudent	Efficient
11	Repairs & Maintenance	Molendinar WTP	1,289	Prudent	Efficient
12	Infrastructure Maintenance - Planned	North Pine WTP	628	Prudent	Efficient
13	Infrastructure Maintenance - Scheduled	Mt Crosby Westbank WTP	508	Prudent	Efficient
14	Catchment Management & Maintenance - Repairs & Maintenance	Hinze Dam	491	Prudent	Efficient
15	Water Quality Monitoring	Gold Coast Desalination Plant	520	Prudent	Efficient

6.3. Wivenhoe Dam, Catchment Management & Maintenance - Salaries and Wages - Awards and Repairs & Maintenance

6.3.1. Overview of operating expenditure

Wivenhoe Dam has the largest storage capacity in Seqwater's system and serves Brisbane and contributes to the water supply for the Gold Coast. It is also designed for flood mitigation to protect South East Queensland and also has a small pumped storage hydroelectric power station.

The operating expenditure items selected for Wivenhoe Dam includes Catchment Management & Maintenance - Salaries and Wages - Awards and Repairs & Maintenance. The Salaries and Wages - Awards cost budget for the Wivenhoe Dam includes staff associated with the Catchment Management and Maintenance while the cost for Repairs and Maintenance is contracted to external parties. Catchment management is inextricably entwined with the functions required to manage water storages and supply treated drinking water. It is a necessary and integral function of water storage management

The forecast 2012/13 expenditure for Catchment Management & Maintenance - Salaries and Wages - Awards at Wivenhoe Dam is $ 299,500 for two FTEs. This is a significant increase from that incurred in 2011/12 when $ 61,500 was budgeted. This apparently large increase is attributable to a significant increase in the forecasted fixed labour costs as a result of better allocation of resource time as

Seqwater obtains better cost allocation information as the business develops after the reform. The budget for 2011/12 was based on data which did not fully allocate cost to the respective assets (most costs were assigned to a general basket). With improved cost allocation process of labour resources implemented during 2011/12, Seqwater has achieved a better understanding of how labour resources have been spent. As a result more allocation has been made directly to the assets rather than to the general basket. This improvement in the allocation of labour resources however means that it is not possible to assess the reasonableness of this operational expenditure item based on historical costs.

The costs for Repairs and Maintenance contracted to external parties have increased slightly from $ 420,000 to $ 446,000, an increase of about 6%. Most of the increase is due simply to the indexation of existing contracts. However, some contracts are due for renewable and Seqwater has allowed a larger increase in these new contracts to reflect market condition. In SKM's assessment, this is probably a reasonable expectation.

The forecast 2012/13 costs and the increase from 2011/12 cost for Catchment Management & Maintenance - Salaries and Wages - Awards and Repairs & Maintenance is shown in **Table 12**.

- **Table 12 Wivenhoe Dam, Catchment Management & Maintenance - Salaries and Wages - Awards and Repairs & Maintenance**

Submission to the Authority	Cost ($000)		
	2011/12	2012/13	% increase
Salaries and Wages - Awards	61	299.5	387.3%
Repairs & Maintenance	420	446	6.3%

6.3.2. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A19 Operational Cost Rpt – Wivenhoe Dam.xlsm*, Seqwater, February 2012
- *Response to RFI ID No 0012 - Wivenhoe Dam salaries and wages*, Seqwater, no date
- *Information Request Response 2012-13: Wivenhoe Dam Catchment Mgmt labour and maintenance*, Seqwater, 8 March 2012

6.3.3. Prudency

This activity is required to maintain Seqwater's obligations under the Grid Contract to supply raw water of the required quality from Wivenhoe Dam. The Grid Contract states that:

> *C9.1 Service Provider must make available Raw Water at Raw Water Supply Points and Potable Water at Potable Water Supply Points in accordance with this Contract, the Market Rules and Approved Operating Protocols.*

C10.1 Service provider must:

i) Test and monitor Portable Water and Raw Water in the Service Provider Infrastructure in accordance with Schedule 2 Legislative Requirements and Good Operating Practice;

C10.2 Service provider must:

j) Ensure that all Potable Water made available at Potable Water Supply Points under this

Contract is fit for human consumption and meets the Quality Requirements; and

k) use its best endeavours to ensure that Potable Water made available at Potable Water Supply Points under this Contract meets the Potable Water Additional Quality Parameters.

Catchment management is a necessary and integral function of water storage management. Seqwater must comply with regulatory obligations to meeting drinking water quality standards and specifically to undertake catchment management. Seqwater must comply with legislative obligations relating to environmental protection, conservation, cultural heritage protection and other land laws, where compliance would otherwise not be possible without effective catchment management. The Ministerial Direction to the Authority relating to its review of 2012/13 grid service charges instructs the Authority to consider the current scope of catchment management activities as prudent.

The engagement of labour and the contracting of repairs and maintenance for the operation of the Wivenhoe Dam fulfil Seqwater's obligations under the Grid Contract. It is also necessary to comply with Seqwater's regulatory and legislative obligations and hence, in SKM's opinion the expenditure is prudent.

6.3.4. Efficiency

Calculation of costs

Active management of catchment and water storage areas is an efficient manner by which to minimise the potential impacts and risks to water quality outcomes (the multi-barrier treatment approach).

Seqwater calculates its salary and wages costs based on the appointed level and salary including any increments and rises applicable of each staff according to the Enterprise Bargaining Agreement. Overtime and allowances are estimated based on historical trends. Labour costs are allocated to the various catchment activities based on the proportionate spend allocated to 2011/12 work orders and adjusted for any known differences between financial years.

Repairs and maintenance contract costs are broken down into the major catchment management activities and work orders are used to capture costs associated with each activity at each location. Budgets are built up by activity by location based on the work order history. Individual activity cost forecasts are based on historical work order information and estimates from Natural Asset Planners. Costs are then adjusted for differences between years in planned activities such as Natural Asset Management Plans and Pest and Weed Management Strategies. Seqwater provided a schedule for weed and pest control and the measures to be taken at the Wivenhoe Dam. This schedule details the eradication or control program for each season, the pest or weed to be targeted and the control measure to be taken. The schedule is reproduced in **Table 13**.

The budgets for this operating expenditure item have been built up by activity and location, based on historical work order information adjusted for known differences. The amounts comprising the total are salaries/wages are inclusive of on-costs such as superannuation, leave entitlements, payroll tax and overtime. The estimated costs are shown in **Table 14**.

Table 13 Wivenhoe Dam, Catchment Management & Maintenance – Weed and Pest control Schedule

Season	Species	Program	Herbicide / Rate
Spring Sept Oct Nov	**Early Detection**	• Survey for new weeds in recreational areas / fire break tracks / boat ramps / wind blown areas / water inflows • Survey for evidence of pest animal activity and refuges and contact Justin Lee or Amanda Purdy if active.	
	Tree: Honey locust (C1)	This is a Class 1 – therefore eradication is required. • Hand remove where possible • Foliar spray / basal bark or stem inject anything too big to hand remove Remove dead trees, any remaining spines are a health hazard	**Fluroxpyr** (Starane Advanced/Hotshot): Foliar spray: 300mL/100L foliar spray on seedlings and young plants up to 2m high; Basal bark: 900mL/100L diesel plants up to 10cm basal diameter, 1.8L/100L diesel plants up to 10-20cm basal diameter, 3L/100L diesel for plants over 20cm basal diameter, treat circumference of stem to a height of 45cm from ground; Cut stump: 3L/100L diesel all plants greater than 20cm basal diameter
	Cactus: Harrisia cactus (C2), other prickly pear species (C2)	These are class 2 – therefore contain and treat infestations. • Physically remove small infestations where possible • Dig out and burn • Release biological control agents	**Triclopyr** (Garlon 600): Folier spray: 3L/100L when actively growing; Basal Bark: 800mL/60L diesel plants up to 10cm or cut stump if larger
	Grasses: Sporobolus (Rats and Parramatta) (C2)	These are class 2 – therefore contain and treat infestations. • Physically remove small infestations where possible • Foliar spray with glyphosate if large area	**Glyhosate 360** (Roundup bioactive, weedmaster duo): 10-15mL/L Apply when mature plant has 20cm of new growth or anytime on seedlings

Season	Species	Program	Herbicide / Rate
		• Cut and spray crown if individual specimens • Respray new growth after it grows to length of original blades (or 20cm as a rough guide)	
	Herbs: Mother-of-millions and it's hybrids (C2)	These are class 2 – therefore contain and treat infestations. • Physically remove small infestations where possible • Burning aids control and grass recovery • Spray when beginning to flower	**Fluroxpyr** (Starane advanced, hotshot): 360mL/100L + surfactant (eg, BS1000 at 100mL/100L) foliar spray on seedlings and young plants before flowering
	Herb: Noogoora burr (LD), Bathurst burr (LD), Saffron thistle (LD)	These are equivalent to class 3 – therefore treat infestations which affect work progress and allow dispersal eg, public access areas, waterline, firebreaks, public view. • Physically remove small infestations where possible • Slash or burn prior to seed set will assist chemical treatment • Release biological control agent when available • Chemically spray at early flowering stage	**Glyhosate 360** (Roundup bioactive, weedmaster duo): 5-10mL/L spot spray or 1L/20L for wipe on. *OR* **Dicamba** (Kamba 500, Banvel): 320 - 560mL for seedlings, apply when at least 3-5 true leaves are actively growing, do not treat when beyond the rosette stage OR **2,4-D 625** (Amicide 625): Foliar spray: 320mL/100L apply to young actively growing weeds, ensuring through coverage.
	Water Plants: Water Hyacinth (C2), Water Lettuce (C2), Salvinia (C2))	Floating weeds are class 2 – therefore contain and treat infestations. • Physically remove small infestations where possible • Foliar spray with glyphosate, regular spraying regime • Boom inflows and infested inlets where possible • Release biological control agents when possible	**Glyhosate 360** (Roundup bioactive, weedmaster duo): 10mL/L spot spray
	Vines, creepers, herbs:	These are class 2 or 3 – therefore contain and treat infestations especially those which affect work	**Glyhosate 360** (Roundup bioactive, weedmaster duo):

Season	Species	Program	Herbicide / Rate
	Rubber vine (C2), Ornamental rubber vine (C3), Cats Claw Creeper (C3), Singapore Daisy (C3)	progress and allow dispersal eg, public access areas, waterline, firebreaks, public view. • Physically remove small infestations where possible • Cut and swab at ground level with preferred herbicide • If aerial tubers, swab both ends of cut • If visible root crown, inject with herbicide • Remove roots and/or tubers where possible • Where possible, replant with natives after creeper treatment	10mL/L foliar spray *OR* **2,4-D 625** (Amicide 625): Spot spray: 3mL/L or 3L/ha when actively growing Cut stump: 160mL/10L water *OR* **Dicamba** (Kamba 500, Banvel): 200mL on mature to 1L on regrowth per 100L wetter, or 2L/ha spot spray when actively growing Rubber vines: 22mL/15L foliar spray *OR* **Triclopyr** (Garlon 600): Rubber vine: Basal bark: 1L/60L diesel plants up to 5cm and cut stump if larger
	Trees: African boxthorn (C2)Camphor Laurel (C3)	These are class 2 or 3 – therefore contain and treat infestations, especially those which affect work progress and allow dispersal eg, public access areas, waterline, firebreaks, public view. • Hand pull or dig out seedlings • Stem inject/basal bark or cut stump anything too big to hand remove or covering a larger area	**Glyhosate 360** (Roundup bioactive, weedmaster duo): Foliar spray: 700mL - 1L /100L water - apply to foliage Stem inject: 1L/2L, paint stump immediately after cutting, or paint basal green bark and/or crown. Cut stump: 2mL undiluted *OR* **Fluroxpyr** (Starane advanced, hotshot): Basal bark 900mL (under 2m) to 3L/100L diesel up to 5cm diameter Cut stump using 6mL undiluted per plant
Summer Dec	**Early Detection**	Survey for new weeds in recreational areas / fire break tracks / boat ramps / wind blown areas / water inflows	

Season	Species	Program	Herbicide / Rate
Jan Feb		Survey for evidence of pest animal activity and refuges and contact Justin Lee or Amanda Purdy if active.	
	Water Plants: Water Hyacinth (C2), Water Lettuce (C2), Salvinia (C2))	Floating weeds are class 2 – therefore contain and treat infestations. • Physically remove small infestations where possible • Foliar spray with glyphosate, regular spraying regime • Boom inflows and infested inlets where possible • Release biological control agents when possible	**Glyhosate 360** (Roundup bioactive, weedmaster duo): 10mL/L spot spray
	Vines, creepers, herbs: Rubber vine (C2), Ornamental rubber vine (C3), Singapore Daisy (C3)	These are class 2 or 3 – therefore contain and treat infestations especially those which affect work progress and allow dispersal eg, public access areas, waterline, firebreaks, public view. • Physically remove small infestations where possible • Cut and swab at ground level with preferred herbicide • If aerial tubers, swab both ends of cut • If visible root crown, inject with herbicide • Remove roots and/or tubers where possible • Where possible, replant with natives after creeper treatment	**Glyhosate 360** (Roundup bioactive, weedmaster duo): 10mL/L foliar spray *OR* **2,4-D 625** (Amicide 625): Spot spray: 3mL/L or 3L/ha when actively growing Cut stump: 160mL/10L water *OR* **Dicamba** (Kamba 500, Banvel): 200mL on mature to 1L on regrowth per 100L wetter, or 2L/ha spot spray when actively growing Rubber vines: 22mL/15L foliar spray *OR* **Triclopyr** (Garlon 600): Rubber vine: Basal bark: 1L/60L diesel plants up to 5cm and cut stump if larger
	Shrub: African Boxthorn (C2), Green	This is a class 2 – therefore contain and treat infestations.	**Glyhosate 360** (Roundup bioactive, weedmaster duo): Foliar spray: 7-10mL/L foliar spray use higher rate on shrubs

Season	Species	Program	Herbicide / Rate
	cestrum (LD),	• Hand pull small plants, cut out larger plants or cut more than 10cm below ground level. • Burning or slashing can allow you to treat it more easily • Foliar spray when necessary, basal bark or cut stump if chemically treating close to water storage. • Apply mulch to avoid root regrowth	over 2m. Cut stump: undiluted *OR* **Triclopyr** (Garlon 600): Foliar spray: 160mL/100L seedlings 1 -2 m tall; 320mL/100L 2-3m tall; Basal Bark: 500mL-2L/60L diesel plants up to 5-10cm basal diameter or cut stump if larger
	Herb: Noogoora burr (LD), Bathurst burr (LD), Saffron thistle (LD)	These are equivalent to class 3 – therefore treat infestations which affect work progress and allow dispersal eg, public access areas, waterline, firebreaks, public view. • Physically remove small infestations where possible • Slash or burn prior to seed set will assist chemical treatment • Release biological control agent when available Chemically spray at early flowering stage	**Glyhosate 360** (Roundup bioactive, weedmaster duo): 5-10mL/L spot spray or 1L/20L for wipe on. *OR* **Dicamba** (Kamba 500, Banvel): 320 - 560mL for seedlings, apply when at least 3-5 true leaves are actively growing, do not treat when beyond the rosette stage OR **2,4-D 625** (Amicide 625): Foliar spray: 320mL/100L apply to young actively growing weeds, ensuring through coverage.
Autumn Mar Apr May	**Early Detection**	• Survey for new weeds in recreational areas / fire break tracks / boat ramps / wind blown areas / water inflows • Survey for evidence of pest animal activity and refuges and contact Justin Lee or Amanda Purdy if active.	
	Water Plants: Water Hyacinth (C2), Water Lettuce (C2), Salvinia (C2), Hymenachne/Olive Hymenachne (C2), Para grass (LD)	Floating weeds are class 2 – therefore contain and treat infestations. • Physically remove small infestations where possible • Foliar spray with glyphosate, regular spraying	**Glyhosate 360** (Roundup bioactive, weedmaster duo): 10mL/L spot spray

Season	Species	Program	Herbicide / Rate
		regime • Boom inflows and infested inlets where possible • The emergent grasses cannot handle shade, encourage riparian shade species	
	Shrub: Groundsel Bush (C2), African Boxthorn (C2), Green cestrum (LD),	This is a class 2 – therefore contain and treat infestations. • Hand pull small plants, cut out larger plants or cut more than 10cm below ground level. • Burning or slashing can allow you to treat it more easily • Foliar spray when necessary, basal bark or cut stump if chemically treating close to water storage. • Apply mulch to avoid root regrowth	**Glyhosate 360** (Roundup bioactive, weedmaster duo): Foliar spray: 7-10mL/L foliar spray use higher rate on shrubs over 2m. Cut stump: undiluted *OR* **Triclopyr** (Garlon 600): Foliar spray: 160mL/100L seedlings 1 -2 m tall; 320mL/100L 2-3m tall; Basal Bark: 500mL-2L/60L diesel plants up to 5-10cm basal diameter or cut stump if larger
	Vines, creepers, herbs: Rubber vine (C2), Ornamental rubber vine (C3), Singapore Daisy (C3), Madeira vine (C3)	These are class 2 or 3 – therefore contain and treat infestations especially those which affect work progress and allow dispersal eg, public access areas, waterline, firebreaks, public view. • Physically remove small infestations where possible • Cut and swab at ground level with preferred herbicide • If aerial tubers, swab both ends of cut • If visible root crown, inject with herbicide • Remove roots and/or tubers where possible • Where possible, replant with natives after creeper treatment	**Glyhosate 360** (Roundup bioactive, weedmaster duo): 10mL/L foliar spray *OR* **2,4-D 625** (Amicide 625): Spot spray: 3mL/L or 3L/ha when actively growing Cut stump: 160mL/10L water *OR* **Dicamba** (Kamba 500, Banvel): 200mL on mature to 1L on regrowth per 100L wetter, or 2L/ha spot spray when actively growing Rubber vines: 22mL/15L foliar spray *OR* **Triclopyr** (Garlon 600): Rubber vine: Basal bark: 1L/60L diesel plants up to 5cm and

<table>
<tr><th>Season</th><th>Species</th><th>Program</th><th>Herbicide / Rate</th></tr>
<tr><td></td><td></td><td></td><td>cut stump if larger</td></tr>
<tr><td>Winter
Jun
Jul
Aug</td><td>Early Detection</td><td>• Survey for new weeds in recreational areas / fire break tracks / boat ramps / wind blown areas / water inflows
• Survey for evidence of pest animal activity and refuges and contact Justin Lee or Amanda Purdy if active.</td><td></td></tr>
<tr><td></td><td>Herbs:
Mother-of-millions and its hybrids (C2)</td><td>These are class 2 – therefore contain and treat infestations.
• Physically remove small infestations where possible
• Burning aids control and grass recovery
• Spray when beginning to flower</td><td>Fluroxpyr (Starane advanced, hotshot):
360mL/100L + surfactant (eg, BS1000 at 100mL/100L) foliar spray on seedlings and young plants before flowering</td></tr>
<tr><td></td><td>Shrub:
African boxthorn (C2)</td><td>This is class 2 – therefore contain and treat infestations.
• Hand pull or dig out seedlings
• Stem inject/basal bark or cut stump anything too big to hand remove or covering a larger area</td><td>Glyhosate 360 (Roundup bioactive, weedmaster duo):
Foliar spray: 700mL - 1L /100L water - apply to foliage
Stem inject: 1L/2L, paint stump immediately after cutting, or paint basal green bark and/or crown.
Cut stump: 2mL undiluted
OR
Fluroxpyr (Starane advanced, hotshot):
Basal bark 900mL (under 2m) to 3L/100L diesel up to 5cm diameter
Cut stump using 6mL undiluted per plant</td></tr>
<tr><td></td><td>Vines, creepers:
Singapore Daisy (C3), Madeira Vine (C3),</td><td>These are class 3 – therefore treat infestations which affect work progress and allow dispersal eg, public access areas, waterline, firebreaks, public view.
• Physically remove small infestations where possible</td><td>Glyhosate 360 (Roundup bioactive, weedmaster duo):
10mL/L foliar spray
OR
2,4-D 625 (Amicide 625):
Spot spray: 3mL/L or 3L/ha when actively growing</td></tr>
</table>

Season	Species	Program	Herbicide / Rate
		• Cut and swab at ground level with preferred herbicide • If aerial tubers, swab both ends of cut • If visible root crown, inject with herbicide • Remove roots and/or tubers where possible • Where possible, replant with natives after creeper treatment	*OR* **Dicamba** (Kamba 500, Banvel): 200mL on mature to 1L on regrowth per 100L wetter, or 2L/ha spot spray when actively growing
FIRE / FLOOD EVENT	Treatment	Land	Physically remove new seedlings & spray regrowth once reach 1m of new growth (shrubs and trees)
RAIN EVENT	Containment	Water	Physically remove when possible & boom new infestations

- **Table 14 Wivenhoe Dam, Catchment Management & Maintenance Labour and Contracted Services Cost Breakdown**

Service	Seqwater Labour	Contracted Services (Repairs & Maintenance)	Total
Fire Management	$ 42,183	$ 40,000 Based on historical work order information.	$ 82,183
Grounds Maintenance		$ 180,000 $ 50,000 – Erosion control works. Based on estimates from Natural Asset Planners $ 50,000 – Maintenance of tree plantings. Based on estimates from Natural Asset Planners $ 80,000 – Land management for Wivenhoe catchment. Includes mowing, slashing, inspections, fence repairs etc. Based on historical work order information.	$ 180,000
Pest Management	$ 19,190	$ 20,000 Based on historical work order information.	$ 39,190
Aquatic Weed Management	$ 199,275	$ 90,000 Based on historical work order information.	$ 289,725
Terrestrial Weed Management	$ 38,380	$ 40,000 Based on historical work order information.	$ 78,380
TOTAL	**$ 299,478**	**$ 370,000**	$ 669,478
Fire Management (General)		$ 76,350 Includes the development of fire management plans and mapping and PP&E	$ 76,350*
TOTAL	**$ 299,478**	**$ 446,350**	$ 745,828

In its response to SKM's Request for Information, Seqwater indicated that it had included in Wivenhoe Dam's Operational Cost $ 76,350 for general Fire Management. This cost item has been allocated to Wivenhoe Dam but relates to fire management across all the assets in that region (of which Wivenhoe is the largest). It is not Wivenhoe Dam specific and so should not have been allocated to Wivenhoe in full but rather proportioned to all assets in the region. However as general fire management is still a legitimate cost, the misallocation does not impact on the total operating expenditure requirement of Seqwater.

Delivery of service

Seqwater employs some in house resources for these activities and engages contractors for repairs and maintenance. For Wivenhoe Dam Catchment Management & Maintenance, an equivalent of two FTEs are employed comprising of various resources at their respective salary/wage levels. The allocation to Wivenhoe is shown in **Table 15**.

- **Table 15 Seqwater – Wivenhoe Dam, Catchment Management & Maintenance Labour Allocation and Cost**

Position	Base Salary	Oncost	Fire Mgt	Pest Mgt	Weed Mgt Aquatic	Weed Mgt Terres-trial	Allocated to Wivenhoe	Cost to Wiven-hoe
Senior Land	$ 92,985	$ 21,979	20%	0%	0%	0%	20%	$ 22,993

Position	Base Salary	Oncost	Fire Mgt	Pest Mgt	Weed Mgt Aquatic	Weed Mgt Terres-trial	Allocated to Wivenhoe	Cost to Wiven-hoe
Management Officer								
Senior Bio Security Officer (1)	$ 98,346	$ 23,082	0%	0%	15%	0%	15%	$ 18,214
Senior Bio Security Officer (2)	$ 90,676	$ 21,531	0%	0%	15%	0%	15%	$ 16,831
Senior Field Ranger	$ 59,983	$ 14,048	5%	5%	10%	10%	30%	$ 22,209
Maintenance Ranger (1)	$ 71,257	$ 13,799	5%	5%	10%	10%	30%	$ 25,517
Field Ranger	$ 54,511	$ 10,639	5%	5%	10%	10%	30%	$ 19,545
Maintenance Ranger (2)	$ 54,511	$ 10,639	5%	5%	10%	10%	30%	$ 19,545
Lead Ranger	$ 76,540	$ 17,874	5%	5%	10%	10%	30%	$ 28,324
Total Salary and Wages	**$ 598,808**	**$ 133,591**	**45%**	**25%**	**80%**	**50%**	**200%**	**$ 173,178**

Efficiencies and economies of scale

Where resources are available, services are performed in house by FTEs. However, where specialised skills are required, or in the event that workload exceeds the available in house resources, external contractors are engaged to perform the activities. The mix of in-house and contracted services is also influenced by prevailing weather conditions and the time of year (eg seasonal impacts and during holiday periods).

All externally sourced services are procured in accordance with Seqwater's procurement policies and processes. A Panel of Service Providers is in place for Catchment Services, and where a suitably qualified contractor is available to undertake the services required, a panel member will be engaged. Where a suitably qualified contract is not available from the Panel, services may be procured outside the panel arrangements in accordance with the procurement process.

Benchmarking

In undertaking this assessment of employee costs we accept that Seqwater is bound by the provisions in the Enterprise Bargaining Agreement particularly relating to pay rates from employment categories and annual pay increases. In other areas where external costs are incurred, Seqwater has put in place it procurement policy and procedure which seeks to ensure value for money in purchasing services required.

Wivenhoe Dam has a 7,020 km2 catchment area. The catchment area accounts for over 40% of the catchment areas of all Seqwater Dams put together. The allocation of two FTEs to manage such a vast catchment area appears reasonable. Nevertheless, Seqwater submitted to SKM that the drivers behind labour requirements at individual locations are related more to known weed and pest problems, combined with weather impacts and seasonal variations, more than metrics around land area and shoreline length.

6.3.5. Summary

The expenditure for Wivenhoe Dam's Catchment Management and Maintenance, salaries and wages and for repairs and maintenance is prudent. This expenditure is required to enable Seqwater to meet its obligations under its Grid Contract and other compliance and legal obligations to support its core business functions.

Given the size of the Wivenhoe Dam Catchment area and the schedule for pest and weed control, the allocation of 2 FTE appears reasonable. The costs are considered to reflect labour market conditions and are in accordance with its Enterprise Bargaining Agreements and Procurement Policies and Procedures. SKM is of the opinion that the expenditure is efficient.

6.4. North Pine Dam, Dam and Source Ops - Employee costs

6.4.1. Overview of operating expenditure

Seqwater has forecast a total cost of $ 342,000 for this operating expenditure item in 2012/13. This represents an increase of over 27% from the 2011/12 expenditure. Salaries/wages account for most of the forecast expenditure and is estimated based on a requirement of 3.4 FTEs at the dam to operate and provide routine maintenance during normal and flood operations. Two FTEs are allocated to the dam full-time while 0.4 FTEs represent the percentage of time, a Coordinator supervising all dams and irrigation schemes in Seqwater's North District devotes to the North Pine Dam. In addition Seqwater employs a trainee at the North Pine Dam. The proposed operating expenditure amount comprises the total salaries/wages inclusive of on-costs such as superannuation, leave entitlements, payroll tax and overtime and protective clothing and safety items.

- **Table 16 North Pine Dam - Dam and Source Ops - Employee costs**

Submission to the Authority	Cost ($000)		
	2011/12	2012/13	% increase
Salaries and Wages - Awards	$ 267,201	$ 339,771	
Protective Items	$ 0	$ 2,000	
Fringe Benefits Tax	$ 150	$ 0	
Uniforms	$ 1,200	$ 0	
Total Employee Cost	**$ 268,551**	**$ 341,771**	**27.2%**

6.4.2. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012

- *A21 Operational Cost Rpt – North Pine Dam.xlsm*, Seqwater, February 2012
- *Information Request Response 2012-13:* North Pine Dam employee costs, Seqwater, 8 March 2012
- *Response to RFI ID No 0012 - North Pine Dam salaries and wages*, Seqwater, no date

6.4.3. Prudency

North Pine Dam is one of the largest dams in SEQ and is part of the Water Grid. There is a need to manage and operate the dam to ensure water can be accessed for treatment at the North Pine Water Treatment Plant and to operate flood releases during any flood events. Since the end of 2010, there have been between 20 and 30 gate releases at North Pine Dam relating to flood events.

North Pine Dam is classified as an extreme hazard dam with gates and a regulated Flood Mitigation Manual for releases. It requires daily inspections and ongoing monitoring of major and minor maintenance. At all times of the year there needs to be one full-time dam operator on call in case of flood events. Hence two staff is the minimum needed to meet this requirement. The extreme hazard dam classification is a reason for the high allocation of the Coordinator’s time. The dam also has issues relating to downstream communities and environmental concerns requiring the Coordinator’s attention.

Seqwater has a program to provide training for trainee dam operators with a view to long term employment. This is part of succession planning as dam operators retire. Seqwater indicates that the age profile among Seqwater dam operators is very high and the trainee program of one trainee operator per District is intended to provide a succession plan and reduce the future risk of not having trained operators available at major storages.

In SKM’s view, this expenditure item is prudent given the dam classification and level of training given to provide for future resourcing needs.

6.4.4. Efficiency

Calculation of costs

Seqwater provided a breakdown of the forecast employment cost at North Pine Dam. This is shown in **Table 17**. The forecast has been estimated based on a bottom up approach where the individual cost of the employees are added up including the oncost and overtime expected. A base salary is calculated for each employee, statutory on-costs are then applied and an allowance is made for overtime based on historical trends. An estimate of the time each employee will work on each facility in their area is applied to give a full time equivalent estimate by facility.

The total cost represents a 27% increase ($ 73,000) from the 2011/12 level. About half of this increase is due to the employment of the trainee ($ 33,400) as Seqwater implements it trainee programme as part of its succession planning. Another $ 16,000 increase is due to an increase in the allocation of the Dam Operations Coordinator’s time from 30% in 2011/12 to 40% to reflect the increase in time required for spillway management and monitoring given the high risk nature of the North Pine Dam where a number of events have occurred recently where water levels have breached the spillway gate mechanism which is located above the top of the gate. The remaining increase is due to the expected increase in overtime due to flooding. The previous 2011/12 budget was based on dry conditions where overtime was low. With the end of the drought, and the return of floods, increased overtime is expected to be required.

- **Table 17 Salaries and Wages - North Pine Dam**

Position Description	Base Salary	Oncost	% Applied	Salaries and Wages
Operations Coordinator (North)	$ 134,109	$ 30,062	40%	$ 65,669
Dam Operator	$ 68,986	$ 12,658	100%	$ 81,644
Lead Dam Operator	$ 74,506	$ 12,867	100%	$ 87,373
DS Trainee 3	$ 25,496	$ 7,889	100%	$ 33,384
Overtime				$ 73,700
Total				**$ 341,771**

Delivery of service

All resources for the operation of North Pine Dam are provided by in house Seqwater staff. Seqwater indicates that the service delivery method applied at North Pine provides for Seqwater staff only to operate North Pine Dam, thereby minimising risk and liability, minimising costs from meeting peak labour demand during floods by using standby staff, and ensuring ongoing maintenance of in-house knowledge and capabilities.

Efficiencies and economies of scale

The resources employed at North Pine Dam are full time employees hired through normal recruitment processes including advertising and interviews. The trainee program is an organisation-wide process focused on succession planning and future risk mitigation.

Seqwater states that the cost of full time staff is lower than sourcing labour through contracts. In addition, there is no practical way of fulfilling the necessary duties and flood operations using part time contractors. Utilising contractors to operate dams that have significant risk issues relating to dam safety, flood operations and the provision of water supply is also not appropriate and during flood operations there is a concern regarding compliance, insurance and legal issues.

During flood events, North Pine Dam requires a team of 6 to 8 operators operating around the clock. These are sourced from trained standby operators employed within Seqwater seconded from other areas who are not required in their primary areas of responsibility during flood events. This reduces the cost from the alternative of having 6 full time staff at the dam to provide for ad hoc flood duty. During flood operations, the full time staff dam operator is responsible for supervising the standby operators.

Benchmarking

In undertaking this assessment of employee costs we accept that Seqwater is bound by the provisions in the Enterprise Bargaining Agreement particularly relating to pay rates from employment categories and annual pay increases.

6.4.5. Summary

In SKM's opinion, the employment of in house labour for the operation of North Pine Dam is consistent with Seqwater's obligations under the Grid Contract and hence, is prudent. The labour costs associated with operating the dam depend on the type of infrastructure at the dam, the labour requirements of its operations, and the structure of the organisation. While published data relating to employee costs relating to catchment management are not readily available, the employment cost details revealed to SKM by Seqwater for the North Pine Dam appears to be reasonable and in our view is efficient for the services rendered.

6.5. Bundamba Advanced Water Treatment Plant, Employee Expenses

6.5.1. Overview of operating expenditure

Bundamba Advanced Water Treatment Plant is a microfiltration (reverse osmosis) advanced oxidation water recycling plant with the capacity to produce up to 66 ML of water a day, of which 20 ML is supplied to Swanbank Power Station. Part of the Western Corridor Recycled Water Project, the Bundamba Advanced Water Treatment Plant is part of the Queensland Government's South East Queensland Regional Water Strategy and Water Grid to supply south east Queensland with a long term water supply that is climate resilient and not dependent on rainfall. The development of the plant was commissioned at the height of the drought that affected south east Queensland for much of the 2000s and a long term contract has been awarded to Veolia Water to operate the plant for Seqwater from 2008.

- **Table 18 Bundamba Advanced Water Treatment Plant, Employee Expenses**

Submission to the Authority	Cost ($000)		
	2011/12	2012/13	% increase
Employee Expenses	$ 2,053,999	$ 2,418,984	17.8%

6.5.2. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A30 Operational Cost Rpt – Bundamba AWTP.xlsm*, Seqwater, February 2012
- *Information Request Response 2012-13: Bundamba AWTP employee costs*, Seqwater, 9 March 2012
- *Response to RFI ID No 0012 - Bundamba AWTP employee costs*, Seqwater, no date

6.5.3. Prudency

The employee costs relate to labour costs of the operations contractor, Veolia Water. These labour costs are for plant operations, including maintenance tasks that are not outsourced to specialist third party maintenance contractors. Labour is a necessary input to the operation of the Bundamba Advanced Water Treatment Plant, which is required under the Grid Contract.

The Grid Contract requires Seqwater to ensure its infrastructure is maintained to enable Seqwater to meet all Legislative Requirements. Clause 3.7 of the Grid Market Rules requires Seqwater to operate and maintain its infrastructure in accordance with Good Operating Practice.

The Grid Market Rules provide an extensive definition of Good Operating Practice (Clause 3.13), which includes "sufficient, adequately experienced and trained operating personnel are available to operate the Infrastructure properly and efficiently taking into account any manufacturer guidelines and specifications for components of the Infrastructure".

The Water Grid Manager operating strategy requires the Bundamba Advanced Water Treatment Plant produce for the existing power customers. The SEW Water Grid Manager has forecast demand of 4,380 ML for 2012/13 (12 ML per day). Labour resources are required to operate and maintain the plant to make this water available.

6.5.4. Efficiency

Calculation of costs

Operation of the Western Corridor Recycled Water Scheme is outsourced to Veolia Water Australia under a 15 year operations and maintenance agreement effective from the final asset completion. Veolia Water is reimbursed for the actual costs of operating the scheme as incurred under the Establishment phase of the agreement.

This category represents the employment costs for human resources to operate the Advanced Water Treatment Plant at Bundamba. All of these personnel are employed by Veolia Water. The hourly rates are based on the rates that applied in 2011/12, indexed at 3.5%. This rate of increase was subject to negotiation with Veolia water, and is the same rate as Seqwater's Enterprise Bargaining Agreement. The hourly rates were subject to review and negotiation with Veolia Water. Increases to the base rates, set in 2009/10, have been limited to 3% for 2010-11 and 3.6% for 2011/12. The amount of labour resources required is based on Veolia Water's labour modelling which defines

- the number of operators required to undertake both operations and maintenance tasks
- plant management required for the plant such as the plant manager, operations supervisors, maintenance supervisors
- a specific allocation of other specialist technical resources required at the plant at various times throughout the year, eg Asset Manager, Reliability Manager, Process engineers

Employee costs have been derived from an agreed schedule of Veolia Water employees, their hourly rates, and the total number hours of work for the year. These also include hours for overtime which is based on 4 hours per operator per month.

Delivery of service

The contract was inherited by Seqwater via the merger with WaterSecure and alternative methods for delivering the service are not available until expiration of the agreement. According to the contract Veolia Water will operate and maintain the plant for 15 years, with options for 5 year extensions. Due to this contractual arrangement there are no other alternative or feasible methods for delivering this service in 2012/13.

Benchmarking

Advanced water treatment plants of the type at Bundamba are still a relatively new technology. There is little published benchmarking data available to verify staffing requirements. Furthermore, with the end of the drought, the operation of the plant has been scaled back thereby complicating any benchmarking analysis.

SKM has examined Seqwater's process and consider this to be adequate. Seqwater requires Veolia to model its labour requirements for the various tasks represent good practice given the information that is available. Seqwater undertakes analysis of Veolia's staffing resources as part of the budget review with Veolia. The analysis includes:

- A comparison of the FTE numbers proposed by Veolia (by plant, network, scheme office and projects). The review compared the FTEs required against the actual number employed in 2010/11, the 2011/12 budget and the proposed 2012/13 budget
- A comparison and analysis of employee costs, hourly rates and FTE numbers is made to confirm that the proposed employee costs align with the FTE numbers.
- For 2012/13, the FTEs proposed for the Western Corridor Recycled Water Scheme (excluding FTEs for project works, capex, defects and flood projects) total 66.5, compared to 67.8 FTEs in 2011/12 and 78 FTEs in 2010/11

While the process Seqwater follows to ascertain the staffing requirements of Veolia is appropriate, it does not explain why the employee cost allocated to Bundamba has increased by almost 18% in 2012/13. In fact the number of FTEs employed by the Western Corridor Recycled Water Scheme has reduced from 67.8 FTEs in 2011/12 to 66.5 FTEs in 2012/13.

Seqwater did indicate that for 2012/13 includes a provision for an increase in the number of FTEs for Project Management work, to reflect the program of capital work proposed for 2012/12. As this increase is directly related to the capital works program, there should be no impact on the operating expenditure and employee cost at Bundamba Advanced Water Treatment Plant.

In the absences of additional information explaining the cost increase, SKM is of the view that the increase is not justified after taking into consideration the 3.5% increase in hourly rates. This amounts to $ 2,085,127.08 for 2012/13.

6.5.5. Summary

The expenditure for employee costs is prudent. Seqwater has clear obligations in the Grid Contract to produce and supply purified recycled water to meet specified demands. Employees are required to both operate and maintain the advanced water treatment plants.

Given the lack of published benchmarking data for staffing levels of advanced water treatment plants, no firm view can be stated regarding the reasonableness of staffing at Bundamba Advanced Water Treatment Plant. However, considering the steps taken by Seqwater to verify staffing requirements we conclude that the proposed staffing levels for the plants in their current mode of operation is probably reasonable. However, Seqwater has proposed an increase in employee cost of almost 18% from the 2011/12 level. This we find unsubstantiated as the agreed hourly rate adjustment with Veolia is just 3.5% and the number of FTEs required for the Western Corridor Recycled Water Scheme has fallen from 67.8 FTEs in 2011/12 to 66.5 FTEs in 2012/13. In the absence of further information justifying the increase we consider this expenditure to be inefficient and recommend the employee cost for Bundamba Advanced Water Treatment Plant be revised to $ 2.09 million. This is shown in **Table 19**.

- **Table 19 Bundamba Advanced Water Treatment Plant – Revised employee cost**

SKM Recommendation	2012/13
Employee Cost	$ 2,085,127.08

6.6. Seqwater Corporate Cost, People and Culture

6.6.1. Overview of operating expenditure

Seqwater's People and Culture team is responsible for designing and delivering the services and programs to enhance the availability and capability of its human resources to deliver the strategic and operational objectives of the business. It includes human resourcing and capability (knowledge and skill) and covers all human-related functions including Learning and Development, Organisational Development, Human Resources, Industrial Relations, HR Information System and metric reporting,

In 2011/12, the expenses of Seqwater's People and Culture team amounted to $ 3.85 million after adjustment are made to ensure consistency. Seqwater has proposed a cost of $ 4.35 million for 2012/13, a 13% increase. This is comprised for $ 1.5 million for salaries and wages, $ 460,000 for external recruitment fees, $ 1.87 million for training and $ 540,000 for other supplies and services.

- **Table 20 Corporate Cost, People and Culture**

Submission to the Authority	Cost ($000)		% increase
	2011/12	2012/13	
Salaries and Wages	$1,391.6	$1,476.8	6.1%
Recruitment Fees	$198.2	$460	132.1%
Training	$1,720	$1,870	8.7%
Other Supplies and Services	$540	$542.9	0.5%

Submission to the Authority	Cost ($000)		% increase
	2011/12	2012/13	
Salaries and Wages	$1,391.6	$1,476.8	6.1%
Recruitment Fees	$198.2	$460	132.1%
Training	$1,720	$1,870	8.7%
Other Supplies and Services	$540	$542.9	0.5%
Total People and Culture	**$3,849.8**	**$4,349.7**	**13.0%**

6.6.2. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A2 Operational Cost* Consolidated Inc Allowable.*xlsm*, Seqwater, February 2012
- *Response to RFI ID No 0012 - People and Culture opex Budget 2012-13*, Seqwater, no date
- *Information Request Response 2012-13: PC Training*, Seqwater, 8 March 2012
- *Information Request Response 2012-13: PC Salaries and Wages*, Seqwater, 8 March 2012
- *Information Request Response 2012-13: PC Recruitment Fees*, Seqwater, 8 March 2012
- *Information Request Response 2012-13: PC Other supplies and services*, Seqwater, 8 March 2012

6.6.3. Prudency

As with most large organisations, human resource employees are required to design and deliver services and programs to enhance resource availability and capability to deliver the strategic and operational objectives of the business. The Service Level KPIs to be met are targeted to:

- Deliver capability programs to meet organisational need and
- Ensure the availability of staff to meet organisational needs.

These roles are in support of the Seqwater's main focus of meeting its Grid Contract, the South East Queensland System Operating Plan, supply under the Water Grid Manager's Operating Strategy and Seqwater's required standard of service.

The role of People and Culture is to ensure the availability of capable staff for all areas of the organisation to meet its operating and strategic roles requires a variety of recruitment strategies to be engaged in order to attract the most suitable candidate. Costs for its various functions depend on the strategy engaged. A number of recruitment consultancies are engaged to assist with the development and implementation of initiatives and vary depending on the work required. Structured educational programs that align with operational requirements are also implemented to improve staff competency.

While this area is not a core function of Seqwater, it is a required support function and SKM is of the opinion that the operating expenditure item is prudent.

6.6.4. Efficiency

Calculation of costs

Salaries and Wages

Salaries and wages are calculated based on previous years costs. It includes a 5% increase for employees on common law contracts which also have a 10% bonus component. Costs associated with employees on Enterprise Bargaining Agreements have a 3.5% increase for the full year and a 3% increase based on the employee's anniversary date. On cost include superannuation and payroll tax. The FTE and salaries and wages costs associated with Seqwater People and Culture team are shown in **Table 21**. Including on cost, the total cost of salaries and wages for 2012/13 is estimated to amount to $ 1.477 million.

- **Table 21 People and Culture, Salaries and Wages**

Roles	FTE	Salaries & Wages	On Costs
Assistant HR Advisor*	0.2	$ 7,245	$ 3,453
Assistant HR Advisor*	1	$ 60,480	$ 12,167
HR Advisor*	0.4	$ 30,031	$ 8,690
HR Advisor	1	$ 91,536	$ 17,936
HR Advisor	1	$ 91,510	$ 18,685
HR Advisor	1	$ 80,470	$ 18,881
HR Advisor/HRIS Admin Assistant	1	$ 55,608	$ 11,303
Manager Organisational Capability*	1	$ 130,402	$ 48,814
Manager People and Culture	1	$ 165,859	$ 62,086
Organisational Capability Advisor	1	$ 83,072	$ 16,214
Principal HR Advisor*	1	$ 107,324	$ 25,407
Principal HR Advisor	1	$ 110,696	$ 21,470
Principal OD Advisor*	1	$ 108,731	$ 22,086
Assistant L&OD Advisor	1	$ 53,473	$ 13,149
Total Salaries and Wages		**$ 1,176,436**	**$ 300,340**

Recruitment Fees

Seqwater expects that 62.5 additional FTEs will be required in 2012/13. This is in addition to the recruitment undertaken due to replace staff that will leave the organisation. As a result, Seqwater expects to require recruitment for 121 permanent roles. Most of the vacancies will be advertised externally and recruitment agencies will be engaged for a number of specialist roles which have proven hard to fill. Seqwater has assumed that 22 roles will need to be managed by recruitment agencies which will incur a placement fee of between 12% and 20% of the total salary package (including base, superannuation and bonus). The placement fee cost breakdown is shown in **Table 22**.

- **Table 22 People and Culture, Placement Fees**

No of staff required	Salary package	% of salary	Placement fee per staff	Total cost
6	$ 100,000	12%	$ 12,000	$ 72,000
7	$ 112,000	15%	$ 16,800	$ 117,600
4	$ 150,000	18%	$ 27,000	$ 108,000
3	$ 90,000	20%	$ 18,000	$ 54,000
2	$ 206,000	18%	$ 37,080	$ 74,160
Total Placement Fee			$ 425,760	

In addition, advertising costs for recruitment that does not use external consultants are expected to cost $ 34,371. This comprises of 81 roles advertised in Seek at $ 91 per role and 9 roles in the Courier Mail at $ 3,000 per role. Total cost for recruitment is estimated at $ 460,000 in 2012/13.

Training

Seqwater expects to use external providers to develop and run the training programs required as Seqwater is not a registered training organisation. The engagement of services will be in accordance with Seqwater's procurement processes. Quotes will be sought for the structured programs of significant value. Training programs are available for employees who are able to identify conferences/seminars and skill development courses applicable to their role. Seqwater has implemented a Learning and Development Procedure to be followed for employees seeing to attend such training sessions.

Seqwater has budgeted a total of $ 1.87 million for training. The budget includes:

- Microsoft Applications Training at $ 220/head. This is expected to be applied for the whole organisation (approximately 500 staff) and will be based on quotes for appropriate training and number of staff within the organisation. Total cost is expected to be $ 110,000. Seqwater has confirmed that they expect this training programme will be conducted for all 500 staff during the 2012/13 year
- CIS Application Training with a total cost of $ 50,000 – based on quotes for comparable work done previously. The training program will be developed by an external provider however it will be run using in house resources
- Staff Skill Development with a total cost of $ 50,000 – based on comparable work done by consultants in 2011/12
- Leadership Program (building on Streamline and the leadership program of 2011/12) with a total cost of $ 300,000 – based on the costs of the program in 2011/12 and inclusive of costs for additional specific reports requested
- Technical Training (for Systems and Instrumentation based applications adopted across the organisation) with a total cost of $ 250,000 based on quotes from relevant specialist providers

- VET Based qualifications – based on the number of operational staff and quotes for the specific qualifications. Total cost in 2012/13 is expected to be $ 730,000 in 2012/13
  - Cert III – 30 staff @ $ 6,000/head, total cost of $ 180,000
  - Cert IV – 40 staff @ $ 10,000/head, total cost of $ 400,000
  - Diploma – 10 staff @ $ 15,000/head, total cost of $ 150,000
- Membership fees – Engineers/Academia/Management. Total cost in 2012/13 is expect to be $ 50,000 based on previous memberships paid for in 2011/12 for staff in relevant and appropriate roles
- Masters/University Qualifications (based on 12 month period for 3-4 years part time). Total cost is expected to be $ 80,000 based on 2011/12 requirements and approved requests
- Conferences/Seminars – due to the nature of the industry Seqwater operates in, it is essential to ensure continuous education through conferences/seminars to keep up-to-date with a variety of specialist matters (eg water quality). The 2012/13 cost of $ 250,000 has been determined based on the approved conference requests in 2011/12
  - Major – 50 staff @ $ 2,500, total cost of $ 125,000
  - Medium – 100 staff @ $ 1,000, total cost of $ 100,000
  - Minor – 250 staff @ $ 100, total cost of $ 25,000

Other Supplies and Services

All the work in this area will be completed by various specialist external parties. Due to the specialist nature of the services required and the volume of work, Seqwater states that it is not feasible to complete using in-house resources. External service providers will be engaged in accordance with Seqwater's procurement processes and quotes will be sought for the initiatives. The aim of engaging such services is to ensure the availability and capability of staff to meet future Seqwater operational requirements. Budget is based on previous year costs with a 3% escalation applied to the costs for 2011/12.

Seqwater has budgeted a total of $ 542,900 for this cost item. The budget includes:

- EBA Negotiation and Implementation (ballot process), total cost of $ 52,000 – based on quotes from external providers
- HR Investigations – 6 X $ 28,000, total cost of $ 168,000 – based on number and costs involved of investigations in previous years 2010/11 and 2011/12
- HR Solutions (specific issue) – 3 X $ 3,000, total cost of $ 9,000 – based on similar work undertaken in 2011/12
- Advice on entitlements – 6 X $ 500 , total cost of $ 3,000 – costs based on previous year 2011/12 and number of advice requests sought
- CIS System Review – total cost of $ 45,000 – costs based on quotes from specialist providers and comparable work undertaken in 2011/12

- Creation and Implementation of E-Learning – total cost of $ 11,500 – costs based on quotes for similar work in the organisation
- Employment agency costs for temporary staff – total cost of $ 10,000 – based on outcomes and staffing requirements of 2011/12
- Licences (CIS HR Module, Org Plus, Hay Group) – total cost of $ 11,500 – based on costs for 2011/12
- Streamline (annual employee survey) – total cost of $120,000 based on work completed in 2011/12 plus quotes for additional reports requested for 2012/13
  - Survey, data collection, reports, roll out strategy (by external provider) - $ 105,000
  - Delivery of leader feedback (one-on-one sessions with consultant) - $ 11,500
  - Posters, merchandise, travel for briefings - $ 3,500
- Values Integration and Awards – total cost of $ 5,000 – based on costs incurred during 2011/12
- Diversity Policy Implementation – total cost of $ 9,000
- Service Recognition Awards – total cost of $ 5,000 – based on costs incurred during 2011/12. Costs are anticipated to be less than 2011/12 as the launch was held in 2011/12
- Development of Learning Framework (Skills and Competencies) – total cost of $ 50,000 – based on comparable work undertaken in the organisation in 2011/12
- Development and Implementation of CIS module on skills, qualification and competencies – total cost of $ 28,000 – based on similar work undertaken for the HR & OHS modules in 2009/10 and 2011/12

Delivery of service

The services provided by the People and Culture team are sourced from a mix of in house staff and external consultants. For a number of functions, due to the nature of the work, confidentiality of information and the internal business knowledge required to perform the work effectively and deliver on the business strategy, it is more cost efficient to design, deliver and maintain the services within house staff. It is also more efficient to use in house resources to undertake a number of business as usual activities where it is usually not feasible to outsource.

Most recruitment activity is handled internally as it is usually more cost effective to manage recruitment in house rather than incur agency placement fees through the use of external providers. These internally managed recruitment activities will incur an external cost when advertising through Seek and the Courier Mail/regional newspapers. Often there are no comparable alternative suppliers of these services especially in regional areas. External recruiters are often used for specialist positions that have proven to be difficult to fill. These engagements will incur a placement fee.

As indicated above, Seqwater expects to use external providers to develop and run the training programs required in accordance with Seqwater's procurement processes as Seqwater is not a registered training organisation, with quotes sought for programs of significant value. A similar arrangement applies to other supplies and services where due to the specialist nature of the services required and the volume of work, it is not feasible to engage in house resources.

Benchmarking

In undertaking this assessment of employee costs we accept that Seqwater is bound by the provisions in the Enterprise Bargaining Agreement particularly relating to pay rates from employment categories and annual pay increases. In other areas where external costs are incurred, Seqwater has put in place it procurement policy and procedure which seeks to ensure value for money in purchasing services required.

The 2012/13 budget for salaries and wages show a 6% increase compared to the 2011/12 budget. This is above the 3.5% annual pay increase based on the Enterprise Bargaining Agreement. However, after taking into consideration performance based increases beyond that stipulated by the Enterprise Bargaining Agreement, SKM is of the view that the increase in salaries and wages is reasonable.

The budget for training is expected to increase by 8.7% from the 2011/12 level. This increase can be explained by the additional Microsoft Application Training cost of $ 110,000 due to be undertaken in 2012/13. After accounting for this cost, the budgeted increase is 2.3%, within the expected rate of inflation.

The budget for Other Supplies and Services is expected to increase by 0.5% well within the expected rate of inflation.

The only budget item in People and Culture that is of concern is the Recruitment cost. In 2012/13, Seqwater budgeted under $ 200,000 for this cost item. In 2012/13, this cost item is expected to more than double to $ 460,000. In response to SKM’s query, Seqwater indicated that in 2011/12, recruitment costs were decentralised across the business. Thus recruitment costs were reflected in the cost of the various departments rather than in the People and Culture budget. WaterSecure however centralised their recruitment costs and this was reflected in the People and Culture 2011/12 recruitment budget with the merger of the two organisations. In 2012/13, all recruitment costs have been centralised. When the budgets of both organisations were merged, these recruitment costs relating to ex-WaterSecure activities/areas were allocated to the People & Culture budget.

Assessment of this cost item indicates that a large proportion (over 90%) of the budgeted cost is to fund the placement fee for that expected 22 roles that requires assistance from recruitment agencies. Recruiting 99 FTEs using internal resources cost are expected to cost less than $ 35,000, implying a cost of about $ 350 per FTE. The cost of using external recruitment agencies amount to almost $ 20,000 per FTE, over 55 times greater. While there may be an argument for using recruitment agencies for some difficult to fill vacancies, SKM questions the need for using external agencies to recruit for that many roles (over 20% of vacancies) at such a high cost. We would expect that recruitment agencies be engaged to identify senior management/staff perhaps at Senior Manager and above level. Based on **Table 22**, we expect that perhaps only 6 vacancies would meet this criterion (salary package of $ 150,000 and above). We thus recommend that recruitment placement fees be reduced to $ 216,400 (a reduction of $ 243,600 from the placement fee budget). Some addition cost will however be incurred as these positions would need to be advertised and SKM has assumed that the Courier Mail will be engaged at a cost of $ 3,000 per position. An additional $ 48,000 is thus added to this the recruitment budget. The net position of the recruitment budget is thus a reduction of $ 195,600 resulting in a recruitment budget of $ 264,400.

In its 2011/12 submission to the Authority, LinkWater provided a report titled Corporate Cost Benchmarking dated March 2011. In this report, produced by KPMG for LinkWater, a benchmark was provided for human resources services which indicated that for every $ 1,000 of revenue, human resource expenditure ranges from a low of $ 4.07 to a high of $ 9.26 with a median of $ 5.29. Based on the 2011/12 revenues of Seqwater (including WaterSecure), this indicates that for Seqwater, a reasonable range for human resources expenditure is between $ 2.9 million and $ 6.5 million with a median value of $ 3.7 million (unadjusted for inflation). Seqwater's budget for People and Culture is $ 4.35 million. Removing $ 243,600 from the recruitment budget reduces the People and Culture budget to $ 4.15 million. This falls within the reasonable range albeit between the median and high end.

6.6.5. Summary

While this area is not a core function of Seqwater, it is a required function to support its operations to meet its Grid Contract requirements and legal obligations. SKM is of the opinion that in general the operating expenditure item is prudent.

Although higher than the median benchmark, SKM is of the opinion that the expenditure is efficient with the exception of the budget for recruitment fees. We question the need for using external recruitment agencies for 22 roles at an average cost of almost $ 20,000 and would recommend that Seqwater reconsider the need to use of external recruitment agencies except in the most exceptional circumstances. SKM agrees that it is prudent to use recruitment agencies to identify appropriate candidates for hard to fill vacancies and may be efficient for filling senior position. However, we are of the view that it is inefficient for Seqwater to use external recruiters for less senior positions. We thus recommend that the number of position to be recruited using external agencies be reduced from 22 to 6 with a corresponding reduction in cost. The recommended budget for People and Culture of $ 4.15 million falls within the reasonable range provided by KPMG with LinkWater's 2011/12 submission. All external costs are based on historical quotes for comparable work with internal costs consistent with employment contracts and Enterprise Bargaining Agreements.

- **Table 23 People and Culture – Revised Corporate Cost**

SKM Recommendation	2012/13
Salaries and Wages	$ 1,476,777
Recruitment Fees	$ 264,400
Training	$ 1,870,000
Other Supplies and Services	$ 542,900
Total People and Culture	**$ 4,154,077**

6.7. Mt Crosby Eastbank Water Treatment Plant - Electricity

6.7.1. Overview of operating expenditure

Mt Crosby Eastbank is the biggest water treatment plant in SEQ by capacity and by volume supplied. Although the electricity for the Eastbank and Westbank plants is supplied under the same National Metering Identifier (NMI), the facilities are considered separately for the purposes of reporting. The forecast allocation is 85% to Mt Crosby Eastbank and 15% to Mt Crosby Westbank, based on the forecast volume (ML) split as indicated in the Water Grid Manager grid instructions.

The proposed electricity budget for the 2012/13 operating period for Eastbank is $ 2,502,811. This is the cost incurred for treating 81,585 ML of water, resulting in a cost of $ 30.68 per ML. This is split between $ 2,303,554 on black power and $ 199,258 on green power.

The forecast expenditure for the 2011/12 reporting period for Eastbank was $ 1,974,187 for a throughput of 81,751 ML, giving a unit cost of $ 24.15 per ML. The second quarter estimate for electricity costs in the same period is $ 2,402,080 with the estimate of the treated volume revised to 83,119 ML, resulting in a unit cost of $ 28.90 per ML. This corresponds to a 20% increase in the per ML cost compared to the earlier estimate. Although the original forecast split between the Eastbank and Westbank plants was 72:28, the actual allocation so far this period has been closer to the 85:15 split used in this year's submission for 2012/13. **Table 24** shows the proposed operating expenditure profile for 2011/12 and 2012/13.

- **Table 24 Mt Crosby Eastbank Water Treatment Plant Electricity**

Submission to the Authority	Cost ($000)		
	2011/12	2012/13	% increase
Black Electricity	$2,209	$2,304	4.3%
Green Electricity	$193	$199	3.1%
Total Electricity Cost	**$2,402**	**$2,503**	**4.2%**

6.7.2. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A9 Operational Cost Rpt – Mt Crosby Eastbank WTP.xlsm*, Seqwater, February 2012
- *Mt Crosby Eastbank Water Treatment Plant electricity calculations*, Seqwater, 8 March 2011
- *Mt Crosby Eastbank Water Treatment Plant green energy split calculations*, Seqwater, 8 March 2011

6.7.3. Prudency

Mt Crosby Eastbank Water Treatment Plant is a Grid-connected, critical base-load plant; the biggest in SEQ by capacity and by volume supplied. It services a large proportion of the SEQ population that could not otherwise be adequately supplied via alternative water treatment plants.

The operating costs associated with purchasing electricity are considered necessary in order to operate Mt Crosby Eastbank in compliance with the System Operating Plan and the Grid Contract, and in order to meet demand as instructed by the Water Grid Manager. Therefore the expenditure is considered to be prudent.

6.7.4. Efficiency

Calculation of costs

Electricity costs were calculated using a zero base (bottom up) build up, using:

- Volumes provided to Seqwater by SEQ Water Grid Manager annual grid instruction process
- Historical kWh/ML based on FY 2010/11 actual consumption
- Existing contract price (c/kWh)

Both Mt Crosby Eastbank Water Treatment Plant and Mt Crosby Westbank Water Treatment Plant source their electricity through a single National Metering Identifier (NMI), requiring an allocation of the electricity supplied through that NMI to be allocated between the two facilities.

The following assumptions have been made in the cost calculations:

- Known energy and regulatory rates have been applied as per the contracts and as per advice from TRUenergy
- Loss factors from 2010/11 financial year have been used
- Increases in network charges and market participant charges are based on historical rate increases and published pricing trend data
- 100% of carbon pricing is passed through, based on advice from TRUenergy
- A peak load (kWh) risk cost is applied across the top five sites by volume, based on the average and maximum peak load evidenced over the past two years
- Green energy costs are allocated across the top five sites by volume

Delivery of service

Electricity for the Mt Crosby Eastbank facility is procured under a contract that was made following a competitive tender process in 2010. The current contract with the energy supplier expires in December 2013. Payments for these services are based on validated monthly invoices.

Market conditions

The introduction of a carbon tax in July 2012 will increase electricity prices by an estimated 2.07 c/kWh on total consumption.

Efficiencies and economies of scale

Seqwater has secured competitive rates for electricity during the tender process in 2010 which are valid until December 2013. Off-peak and peak assumptions are applied based on operational requirements and historical data to forecast costs.

Benchmarking

The electricity for Mt Crosby Eastbank Water Treatment Plant is supplied under a contract procured by competitive tender according to Seqwater's procurement policies and procedures. These costs are therefore benchmarked to the market, and no further analysis is considered to be necessary.

6.7.5. Summary

The expenditure is prudent because it is required in order to comply with the System Operating Plan, the Grid Contract, and in order to meet demand as instructed by the Water Grid Manager.

Electricity contracts were procured under a competitive tender process. Electricity prices agreed as part of the 2010 tender process are seen to reflect market rates at the time the contract was signed. These contracts are due for renewal in December 2013. SKM thus accepts that this expenditure is efficient.

6.8. Landers Shute – Treatment chemicals

6.8.1. Overview of operating expenditure

Landers Shute Water Treatment Plant is a grid-connected, critical base-load plant, servicing a large proportion of the Sunshine Coast population that could not be adequately supplied via alternative water treatment plants.

Chemical dosing involves treating water with various chemicals to manage the quality of the water being delivered. The chemical dosing expenses projected to be incurred at the Landers Shute Water Treatment Plant are a variable cost driven largely by volume, chemical prices and the quality of the raw water supplied to the plant.

The forecast expenditure for chemical dosing at the Landers Shute Water Treatment Plant for the 2012/13 reporting period is $ 1,315,336. This is the cost incurred in treating a forecast 28,753 ML at the site, resulting in a cost of $ 45.75 per ML of water treated at the facility.

The dosing cost forecast for the Landers Shute Water Treatment Plant in the 2011/12 reporting period was $ 1,007,886. The volume forecast for that period was 25,100 ML, resulting in a cost of $ 40.15 per ML. The 2011/12 second quarter revised forecast is $ 1,091,690, representing an 8.3% increase against the original forecast for that period.

The forecast unit price for treatment chemicals increased by 14% between the 2011/12 and 2012/13 periods, and the total price by 20% in spite of a reduced base dosage. This is largely due to an additional dosing contingency for periods of adverse water quality and also due to price increases under rise and fall provisions of existing contracts and the estimated impact of carbon tax. The additional dosing allowance included in this year's submission is as a result of recent wet seasons and forecasts of ongoing wetter periods. It does not allow for serious weather events similar to the January 2011 flooding, but it does provide contingency for the likelihood of more adverse weather than was generally experienced prior to 2011. **Table 25** shows the proposed operating expenditure for 2011/12 and 2012/13.

- **Table 25 Landers Shute treatment chemicals**

Submission to the Authority	Cost ($000)		
	2011/12	2012/13	% increase
Treatment chemicals	$ 1,092	$ 1,315	20%

6.8.2. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A12 Operational Cost Rpt – Landers Shute WTP.xlsm*, Seqwater, February 2012
- *Information Request Response 2012-13: Landers Shute WTP*, Seqwater, 8 March 2012
- *Response to RFI ID No 0012 - Landers Shute WTP chemical cals*, Seqwater, no date

6.8.3. Prudency

In meeting the SEQ System Operating Plan requirements relating to the least cost option of supply, Landers Shute Water Treatment Plant is considered one of the lowest cost water treatment plants given the level of treatment, helped by the fact that it has a gravity raw water supply to the plant as well as gravity assisting the supply leaving the plant.

The chemical budget associated with running Landers Shute is driven by forecast supply volumes from the SEQ Water Grid Manager, translated from demand predictions for specific supply areas in line with SEQ System Operating Plan objectives. Compliance with the Grid Contract and other legislative instruments, with respect to water quality parameters, also drives the chemical budget for Landers Shute.

Due to the requirement to chemically treat water to deliver water to the standards required by the various regulatory bodies, Seqwater's chemical dosing operational expenditure is considered to be prudent.

6.8.4. Efficiency

Calculation of costs

Chemical dosing costs vary according to many parameters, including the volume of water to be treated and the quality of the source water as compared to the quality required to be delivered.

The treatment chemical expenses projected to be incurred at the Landers Shute Water Treatment Plant are almost entirely a variable cost. The rate at which chemicals are used may vary on a day-to-day basis depending on the prevailing raw water quality, particularly colour, turbidity and alkalinity. A minor component of chemical costs is fixed and these have been included as a fixed cost (for 2011/12 these costs were included as variable).

Seqwater's proposed operational cost for chemical dosing for Landers Shute was derived using a zero base (bottom up) build up, based on first principles "stoichiometry" in conjunction with historical data, and taking into account the risk of events and variability that can occur that impact on raw water quality and hence chemical doses. The additional chemical dose contingency allowance for risk of wet weather and natural events accounts for around 19% of the overall increase in variable chemical costs for this facility. This contingency does not extend to major events such as an extreme weather or water quality event like the major flood events that occurred in January 2011.

Seqwater has predicted the likely outcomes from the rise-and-fall and contract price adjustment process that will apply after December 2012. For some chemicals, Seqwater has been able to obtain an indication of the likely increase from the suppliers, and based its forecast on this advice. Otherwise, Seqwater has assumed that chemical costs will increase as per historical increases or in nominal terms by between 2.50% and 3.75% depending on the individual chemical.

Delivery of service

Treatment chemicals are fully sourced from external suppliers under three contracts secured through open tenders from panels of providers, created in compliance with internal procurement procedures. The contracts come up for re-tendering on a periodic basis and business needs are assessed under a sourcing strategy. These contracts are largely the same as those that were in place for the 2011/12 review of Grid Service Charges.

Market conditions

The contracts contain periodic price rise and fall provisions, hence the contract pricing can be impacted by a range of external factors including changes to world chemical indices, base raw material pricing and electricity costs. The carbon tax will also impact on chemical prices for 2012/13 due to increasing energy costs for manufacturing; an estimate of this impact has been included as part of forecasting the rise and fall provisions.

Efficiencies and economies of scale

Efficiencies are identified through the sourcing strategy on an ongoing basis.

Benchmarking

The treatment chemicals for Landers Shute are all supplied under contracts procured by competitive tenders in line with Seqwater's procurement policies and procedures, so the costs are already benchmarked against the market. Further benchmarking is therefore unnecessary.

6.8.5. Summary

The expenditure is prudent as it is necessary to meet statutory obligations to provide safe drinking water.

The expenditure is efficient because treatment chemicals are procured through competitive tender, so the costs are in line with the market.

6.9. Luggage Point - Electricity

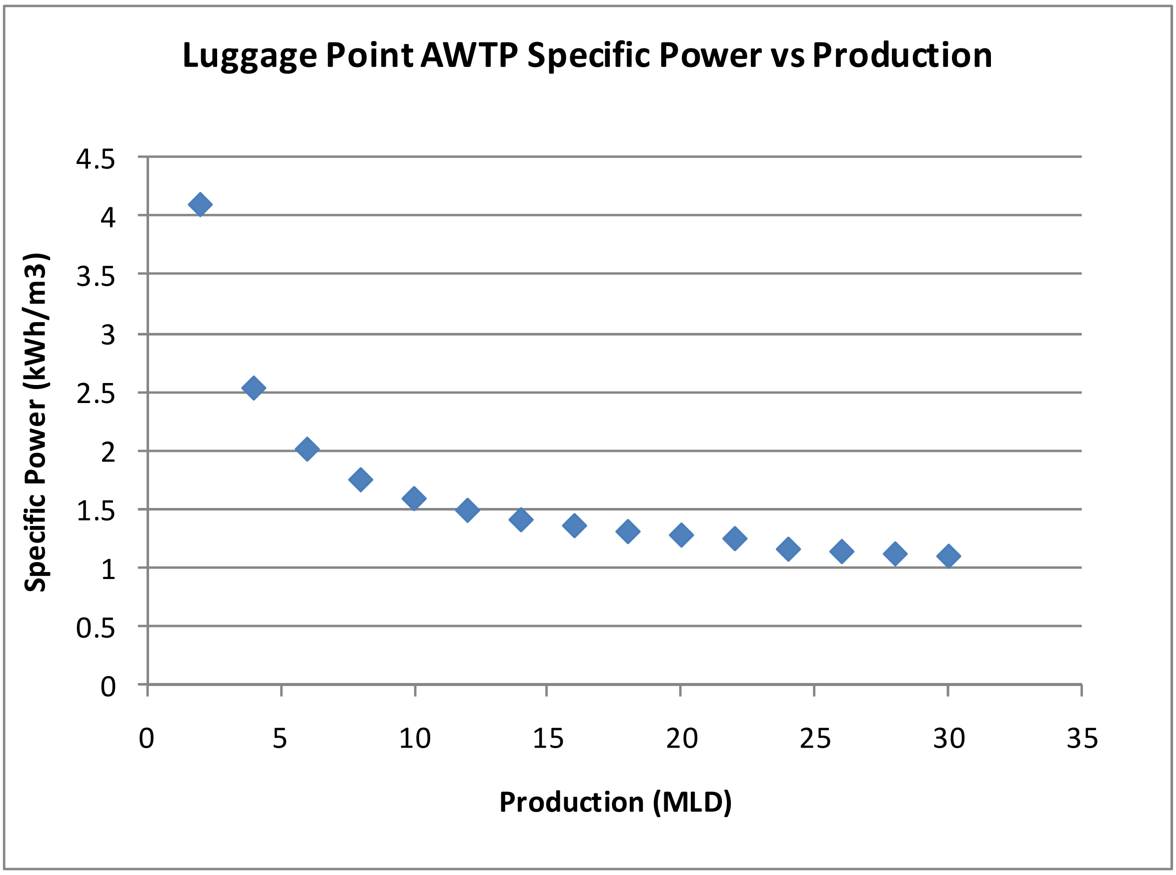
6.9.1. Overview of operating expenditure

This category represents the electricity costs associated with operating the Luggage Point Advanced Water Treatment Plant. This facility forms part of the Western Corridor Recycled Water Scheme, taking treated wastewater and processing it to produce purified recycled water.

The proposed electricity budget for the Luggage Point Advanced Water Treatment Plant for the 2012/13 operating period is $ 1,651,999 for 3,858 ML, which equates to $ 428.26 per ML. However, this is an interim figure. The plant is currently eligible for notified tariffs, but rule changes from July 2012 will mean that electricity must be procured under a market contract. Seqwater has proposed that the Variable Operating Charge for 2012/13 be based on actual contracted energy prices once these are known.

The electricity forecast in last year's submission for the 2011/12 period was $ 1,041,000 for 7300 ML which equates to $ 142.60 per ML. The second quarter estimate of electricity costs for the same period is $ 1,114,222 for 3,650 ML, resulting in a unit cost of $ 305.27 per ML. This increase is mainly due to the fact that the original unit rate was based on a much larger water throughput, which would have required long production cycles or even continuous operation. Because there are major energy costs associated with starting up and shutting down the plant, as well as some fixed energy costs remaining the same regardless of production levels, a smaller volume leads to significantly higher unit costs. The increase in cost per unit volume between the 2011/12 and 2012/13 periods (using the most recent forecasts) is around 40%.

Figure 7 uses historical data from the plant to show how the power per unit volume increases sharply as total purified water production decreases.



- **Figure 7 Luggage Point Advanced Water Treatment Plant specific power versus production**

Table 26 shows the expenditure for the 2011/12 and 2012/13 periods. The average cost per kWh increased by around 27% between last year's budget for 2011/12 and this year's forecast for 2012/13, from $ 0.11/kWh to $ 0.14/kWh.

This increase can be explained by a combination of the following factors:

- An assumed tariff rate increase of 11.39% - Seqwater proposes to update this assumption based on actual contracted energy prices once these are known
- An increase in electricity peak period usage (which is 150% more expensive than off peak rates on a kWh basis), with an assumed 90:10 split between peak and off peak. It is noted that there is currently little demand for water during off peak times, and there is very limited storage within the network.
- A carbon tax allowance of 20%

- **Table 26 Luggage Point Advanced Water Treatment Plant electricity costs**

Submission to the Authority	Original 2011/12		2012/13		% increase	
	Total ($000)	$/kWh	Total ($000)	$/kWh	Total	$/kWh
Electricity Cost	$1,041	$0.11	$1,652	$0.14	48%	27%

6.9.2. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A32 Operational Cost Rpt – Luggage Point AWTP.xlsm*, Seqwater, February 2012
- *Information Request Response 2012-13: Luggage Point Electricity*, Seqwater, 13 March 2012
- *Response to RFI ID No 0012 - Luggage Point Electricity*, Seqwater, no date

6.9.3. Prudency

Seqwater is required to produce water at the Luggage Point Advanced Water Treatment Plant under the Grid Contract. The Water Grid Manager's operating strategy requires the Luggage Point facility to produce purified recycled water for industrial customers. The Water Grid Manager has forecast demand of between 3,857 ML and 5,657 ML for 2012/13.

Electricity is essential to allow the Luggage Point plant to operate; hence this expenditure is required in order for Seqwater to meet its obligations. Therefore SKM considers that expenditure on electricity for Luggage Point Advanced Water Treatment Plant is prudent.

6.9.4. Efficiency

Calculation of costs

A bottom up approach was adopted for estimating costs. The following assumptions were made in calculating the cost of electricity in the 2012/13 period:

- All energy is 'black power' based on Tariff 43, with the following rates:
  - Peak rate: $ 0.14/kWh
  - Off peak rate: $ 0.06/kWh
  - Maximum demand rate: $ 14.05/kW
- Seqwater has assumed a split between peak and off-peak consumption of 90:10 due to the small production runs, timing of end user demands (peak times) and lack of storage in the system
- Demand has been split into variable and fixed portions
- The monthly service charge is based on 30 days as per the Origin website
- Power consumption rate of 1.59 kWh per cubic metre at a production rate of 10.5 ML per day (as per graph of historical data)
- Monthly cost totals based on production rates specified in Flow Rate Summary worksheet
- Treated water pump station power costs are excluded, as these are included in the Pipeline Network budget

In its submission, Seqwater proposes a scheme of two tariffs for Luggage Point: one that is set to recover the costs when the plant is operating at very low daily production rates (less than 10.5 ML per day), and another when daily production exceeds this threshold. This arises from the Water Grid Manager's forecast for 2012/13 which anticipates low volume requirements for the first part of the period, followed by an increase later on as new industrial users require larger volumes. SKM considers this two-tariff system to be a suitable method of helping to ensure more accurate recovery of costs and therefore avoid the need for price review claims. Seqwater has indicated that it intends to submit such a claim for Luggage Point for the 2011/12 period for the funding shortfall due to the difference between forecast and actual volume requirements.

The assumed average unit price for 2012/13 is $ 0.14/kWh, compared to $ 0.11/kWh in the original 2011/12 submission (including demand charge).

Delivery of service

Operation of the Luggage Point plant is outsourced to Veolia Water under a 15 year Operations and Maintenance agreement effective from the final completion of the Western Corridor Recycled Water Scheme in 2010. Veolia Water is reimbursed for actual costs incurred in operating the scheme plus a margin for overhead recovery and profit, paid as a percentage of actual operating costs.

Veolia Water is responsible for procuring energy for the plant as part of the Western Corridor Recycled Water Scheme, but the contract with Veolia Water allows Seqwater some control over electricity sourcing. The plant is currently being supplied under notified tariffs, but these will not be available for 2012/13. Seqwater is in discussions with Veolia Water to determine how to obtain best value from the procurement process, including opportunities for Seqwater to source from the market. Procurement processes are scheduled for completion by 1 June 2012.

There has been no consideration of the cost efficiency of this mode of service delivery as Seqwater inherited this contract from WaterSecure as part of the merger and no alternative delivery methods are available given the terms of the contract.

Market conditions

As of 1 July 2012, notified tariffs will no longer be available. Discussions are currently underway with Veolia Water to determine procurement processes for a new contract.

Efficiencies and economies of scale

Seqwater is seeking to secure efficiencies for 2012/13 electricity costs through its procurement process.

Benchmarking

Seqwater proposes to update the unit rates for electricity based on actual contracted energy prices once these are known. The method of procurement is still under negotiation, let alone the actual terms and rates of the future contract, so there is currently insufficient information to benchmark the costs and to judge whether the expenditure will be efficient.

If the new electricity contract is procured in accordance with Seqwater's procurement policies and in such a manner that the costs are in line with market rates, the Luggage Point energy costs should be efficient.

6.9.5. Summary

Expenditure on electricity for the Luggage Point Advanced Water Treatment Plant is considered to be prudent because it is required for Seqwater to meet its obligations to provide industrial customers with purified recycled water from the plant.

There is insufficient information to conclude whether the expenditure is efficient or not at this stage, because the procurement methods and contract for electricity at the Luggage Point plant have not yet been finalised for the 2012/13 period. However, if the new contract is procured in such a way that the final rates reflect the market, the expenditure should be efficient.

6.10. Gold Coast Desalination Plant – Repairs and maintenance

6.10.1. Overview of operating expenditure

The Gold Coast Desalination Plant was developed as a drought asset, turning seawater into drinking water using a reverse osmosis process. It has the capacity to produce 133 ML of treated water per day, but utilisation has been low recently because of increased water security in the region. The plant operates under a design-build-operate contract with the Gold Coast Desalination Alliance, comprising Seqwater (formerly WaterSecure), John Holland and Veolia Water.

Repairs and maintenance are undertaken on the plant, including:

- Planned mechanical, electrical and civil maintenance
- Repairs and maintenance projects
- Reactive (unplanned) maintenance in the case of break downs
- Stockpiling of critical spare parts

The proposed expenditure for repairs and maintenance of the Gold Coast Desalination Plant for the 2012/13 reporting period is $ 5,167,444.

In last year's submission from WaterSecure, the proposed expenditure for repairs and maintenance of the desalination plant in 2011/12 was $ 4,660,000. The most recent 2011/12 forecast was similar at $ 4,654,850.

There is an 11% increase in expenditure between the most recent forecasts for the 2011/12 and 2012/13 reporting periods, as shown in **Table 27**. This can be explained by a combination of the following:

- A 3.6% increase in unit rates from negotiations with Veolia Water
- An increase in the Preventative budget due to additional allowances for refurbishment and overhaul of a number of pumps, as per manufacturers' recommended maintenance regimes
- A corresponding increase in the Breakdown budget which is set at 13% of the Preventative budget

- **Table 27 GCDP repairs and maintenance**

Submission to the Authority	Cost ($000)		
	2011/12	2012/13	% increase
Repair and maintenance	$ 4,655	$ 5,167	11%

6.10.2. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A29 Operational Cost Rpt* – Gold Coast Desalination Plant.*xlsm*, Seqwater, February 2012
- *Information Request Response to RFI ID No 0012 – Asset 12: Tugun Desalination Plant*, Seqwater, March 2012
- *Information Request Response to RFI ID No 0012 – GCDP repairs and maintenance spreadsheet*, Seqwater, March 2012

6.10.3. Prudency

The Grid Contract requires Seqwater to ensure its infrastructure is maintained to enable Seqwater to meet all legislative requirements. Clause 3.7 of the Market Rules requires Seqwater to operate and maintain its infrastructure in accordance with Good Operating Practice.

The Market Rules provide an extensive definition of Good Operating Practice (Clause 3.13), which includes:

- Sufficient, adequately experienced and trained operating personnel are available to operate the infrastructure properly and efficiently
- Reasonable preventative, routine and non-routine maintenance and repairs are performed by knowledgeable, trained and experienced personnel using suitable equipment, tools and procedures
- Appropriate monitoring and testing is done to ensure equipment is functioning as designed

The Gold Coast Desalination Plant is to operate in Hot Standby Mode for most of 2012/13. Under Hot Standby Mode, Seqwater must be able to deliver water to the water grid from the plant within 24 hours of a request. This means that Seqwater must be satisfied the plant can deliver water within this timeframe, at the specified water quality. Hence the plant must be maintained and kept in a state where it can produce water at any time.

Expenditure on repairs and maintenance for the Gold Coast Desalination Plant is prudent as it is required to enable Seqwater to meet its obligations.

6.10.4. Efficiency

Calculation of costs

A detailed schedule of work was developed in 2010/11 under an asset management system. This work schedule represented the base level of repairs and maintenance required to keep the plant operational (and able to supply water within a 24 hour period), and also maintain warranties by meeting manufacturers' guidelines and specifications. Part of the increase in costs for this reporting period is due to refurbishment and overhaul of a number of pumps, in accordance with manufacturers' recommended maintenance programs.

Strategic maintenance budgets for each of Seqwater's assets are developed under Facilities Asset Management Plans which are developed for each facility. Facilities Asset Management Plans detail 10-year renewal and refurbishment programs that will enhance the reliability and performance of the facilities without materially modifying the facilities. The Facilities Asset Management Plans document the basis for these investment recommendations. An asset management approach is adopted with assets assessed for their criticality and condition. The consequence and likelihood of asset failure is also taken into consideration.

A zero-base build up was adopted for estimating costs. An index of 3.6% was applied to unit rates from the 2011/12 year; this 2012/13 rate increase is the outcome of negotiations with Veolia Water.

Delivery of service

The operations and maintenance for the Gold Coast Desalination Plant were outsourced under contractual arrangements that pre-date the merger between Seqwater and WaterSecure. The outsourcing is to the Gold Coast Desalination Alliance (GCDA), comprised of Seqwater (formerly WaterSecure), John Holland and Veolia Water. This contract formed part of a build-own-operate contract for the plant. Under these contracts, Veolia Water is responsible for procuring all inputs and supplies for the plants, including fleet, chemicals, laboratory testing and labour.

[redacted]

Seqwater inherited this contract from WaterSecure as part of the merger. This contract was negotiated as part of the construction contract for the plant, and would have been influenced by a range of considerations including market conditions and the criticality of the project because of the drought at the time. This contract was in place prior to the establishment of WaterSecure and hence before the merger of WaterSecure and Seqwater.

No alternative delivery methods are available at this time given the terms of the contract.

Market conditions

The Wage Price Index (WPI) rose by an average of 3.7% between December quarter 2010 and December quarter 2011, and the Consumer Price Index (CPI) rose by 3% over the same period. This gives an indication that the unit rate increases of 3% for 2011/12 and 3.6% for 2012/13 as negotiated with Veolia Water are reasonable.

Efficiencies and economies of scale

SKM's assessment of the 2011/12 Grid Service Charges identified the possibility of changing to a 'run to fail' strategy from the current 'preventative maintenance' strategy in order to generate cost savings. However, in 2012/13 the Gold Coast Desalination Plant will be required either to provide water to the grid or to do so with 24 hours' notice, precluding the possibility of long periods of offline maintenance if it were left to run until breakdown.

Benchmarking

In its review of 2011/12 grid service charges, SKM examined the scope of work and costs for repairs and maintenance at the Gold Coast Desalination Plant. SKM, and subsequently the Authority, concluded that these costs were prudent and efficient. The schedule of work and assumed hours has not changed since this review, and remains based on the schedule developed in 2010-11. However the maintenance requirements vary year to year depending on scheduled refurbishments in line with manufacturers' recommendations. The changes to the budget from last year can be explained by a 3.6% increase in unit rates, an increase in the Preventative budget due to scheduled pump overhauls and a corresponding increase in the Breakdown budget which is set at 13% of the Preventative budget. These increases have been partly offset by the removal of the cost centre referred to as *R & M Asset Replacement – Mechanical* and also a reduction in the Spare Parts budget.

Comparison with WPI and CPI increases indicates that the rates negotiated with Veolia Water are reasonable, and the original scope of work and costs for repairs and maintenance for 2011/12 have been assessed as efficient. Therefore SKM considers that the expenditure for 2012/13 is efficient.

6.10.5. Summary

Expenditure on repairs and maintenance for the Gold Coast Desalination Plant is prudent. Seqwater has obligations in its Grid Contract to supply water at the required quantities and quality. SKM considers the establishment of a routine repairs and maintenance system a key part of meeting this obligation.

The expenditure on repairs and maintenance proposed in Seqwater's submission is considered to be efficient, since the scope of work and unit costs have been assessed as efficient and reasonable.

6.11. Pipeline Network – Repairs and maintenance

6.11.1. Overview of operating expenditure

The Pipeline Network is a 210 km large-diameter underground recycled water pipeline which forms an integral part of the Western Corridor Recycled Water Scheme. The Pipeline Network carries raw water to three advanced water treatment plants and carries purified recycled water from the plants to supply industrial customers. There is also a currently unused link to the Wivenhoe Dam which allows purified recycled water to be released if dam water levels become unacceptably low.

Seqwater inherited these assets from WaterSecure as part of the merger which took effect in July 2011; hence these assets were reported under WaterSecure's submission in the last reporting period. This has caused some difficulty in comparing costs between years due to differences in reporting.

The total proposed Pipeline Network repairs and maintenance budget for the 2012/13 reporting period is $ 2,997,198. Seqwater has identified the following maintenance activities for the Pipeline Network:

- Responsive maintenance in the event of breakdown - $ 522,144
- Repairs and maintenance of the raw water pumping stations - $ 547,206
- Repairs and maintenance of the raw water network - $ 488,342
- Repairs and maintenance of the treated water pumping stations - $ 300,562
- Repairs and maintenance of the treated water network - $6 22,665
- Servicing of maintenance equipment - $ 17,353
- Stockpiling of critical spare parts - $ 250,298
- Maintenance projects – $ 248,628

The budget for 2011/12 in last year's submission was $ 1,679,000, comprising $ 1,147,000 in planned maintenance, $ 327,000 in unplanned maintenance and $ 205,000 for stockpiling critical spares. The 2011/12 forecast value remained stable in the second quarter at $ 1,678,139.

There is a 79% increase in forecast expenditure between the 2011/12 and 2012/13 reporting periods, as shown in **Table 28**, equating to $ 1,318,000. This is mainly due to $ 726,000 worth of pipeline easement vegetation control being inadvertently excluded from last year's submission. If this had been included correctly in 2011/12, the increase between years would be 36%.

The rest of the increase is due to a combination of:

- Increase in unit rates across all sections as a result of negotiations with Veolia Water (3.6%)
- Increase in Preventative budget due to structural inspections and tank cleaning in accordance with maintenance schedules ($ 241,000)
- New provisional allowances in the Breakdown budget for pipeline failure and swale repair following heavy rain events ($ 200,000)
- Increase in Spare Parts budget due to a supplier change and need for electrofusion couplings ($ 40,000)

- **Table 28 Pipeline Network repairs and maintenance**

Submission to the Authority	Costs ($000s)		
	2011/12	2012/13	% increase
Repairs and maintenance	$1,678	$2,997	79%

6.11.2. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A33 Operational Cost Rpt – Pipeline Network.xlsm*, Seqwater, February 2012
- *Information Request Response RFI ID 0012 Asset 13, Pipeline Network*, Seqwater, 13 March 2011
- *Pipeline Network repairs and maintenance calculations*, Seqwater, March 2011

6.11.3. Prudency

The Grid Contract requires Seqwater to ensure its infrastructure is maintained to enable Seqwater to meet all legislative requirements. These requirements include the provision of bulk purified recycled water through the Pipeline Network. Clause 3.7 of the Market Rules requires Seqwater to operate and maintain its infrastructure in accordance with Good Operating Practice.

The Market Rules provide an extensive definition of Good Operating Practice (Clause 3.13), which includes:

- Sufficient, adequately experienced and trained operating personnel are available to operate the infrastructure properly and efficiently
- Reasonable preventative, routine and non-routine maintenance and repairs are performed by knowledgeable, trained and experienced personnel using suitable equipment, tools and procedures
- Appropriate monitoring and testing is done to ensure equipment is functioning as designed

The Western Corridor Recycled Water Scheme is currently only supplying industrial users such as power stations, but there is a possibility of purified recycled water being delivered to the Wivenhoe Dam to augment drinking water supplies in the case of a drought.

Expenditure on repairing and maintaining the Pipeline Network is prudent as it is required to enable Seqwater to meet its obligations under the Grid Contract.

6.11.4. Efficiency

Calculation of costs

A detailed schedule of work was developed in 2010/11 under an asset management system. This work schedule represents the base level of repairs and maintenance required to keep the network operational (and able to supply water within a 24 hour period), and also maintain warranties by meeting manufacturers' guidelines and specifications.

Strategic maintenance budgets for each of Seqwater's assets are developed under Facilities Asset Management Plans which are developed for each facility. Facilities Asset Management Plans detail 10-year renewal and refurbishment programs that will enhance the reliability and performance of the facilities without materially modifying the facilities. The Facilities Asset Management Plans document the basis for these investment recommendations. An asset management approach is adopted with assets assessed for their criticality and condition. The consequence and likelihood of asset failure is also taken into consideration.

A zero-base build up was adopted for estimating costs. An index of 3.6% was applied to unit rates from the 2011/12 year; this 2012/13 rate increase is the outcome of negotiations with Veolia Water.

The new provisional allowances in the Breakdown budget form almost 40% of the total Breakdown budget. An appropriate proportion is considered to be 10 - 15%, therefore the total efficient cost for the provisional allowances is considered to be $ 75,600 which is 15% of the total Breakdown budget of $ 504,000. This leaves an inefficient expenditure of $ 124,400.

Delivery of service

[redacted]

While this may not be the most cost efficient way of delivering the service, particularly given the length of contract and the fact that the agreement was drawn up with the expectation of much higher utilisation of the recycled water network, the contract was inherited by Seqwater and therefore alternative methods of delivery are not available until expiration of the agreement.

Market conditions

The Wage Price Index (WPI) rose by an average of 3.7% between December quarter 2010 and December quarter 2011, and the Consumer Price Index (CPI) rose by 3% over the same period. This gives an indication that the unit rate increase of 3.6% for 2012/13 as negotiated with Veolia Water is reasonable.

Efficiencies and economies of scale

No efficiency gains or economies of scale have been identified by Seqwater.

Benchmarking

In its review of 2011/12 grid service charges, SKM examined the scope of work and costs for repairs and maintenance of the Pipeline Network. SKM, and subsequently the Authority, concluded that these costs were prudent and efficient. Seqwater's submission states that the schedule of work and assumed hours has not changed since this review, and remains based on the schedule developed in 2010/11. Information provided by Seqwater in response to SKM's querying the reason for the large increase in cost between 2011/12 and 2012/13 has established that a large portion of costs for vegetation control of pipeline easements was not included in the 2011/12 submission. This accounted for around half of the cost increase between years.

Comparison with WPI and CPI increases indicates that the rates negotiated with Veolia Water are reasonable, and the original scope of work and costs for repairs and maintenance for 2011/12 have been assessed as efficient. Therefore SKM considers expenditure for 2012/13 is efficient.

6.11.5. Summary

Expenditure on repairs and maintenance for the Pipeline Network is prudent. Seqwater has obligations in its Grid Contract to supply water at the required quantities. SKM considers the establishment of a routine repairs and maintenance system a key part of meeting this obligation.

Expenditure on repairs and maintenance for the Pipeline Network is not efficient. Comparison with WPI and CPI increases indicates that the rates negotiated with Veolia Water are reasonable, and the original scope of work and costs for repairs and maintenance for 2011/12 have been assessed as efficient. However, new provisional allowances in the Breakdown budget are excessive. A total provisional allowance of 15% of the Breakdown budget has been assessed as efficient, leaving an inefficient expenditure of $ 124,400. **Table 29** shows the proposed revised operating expenditure.

- **Table 29 Pipeline Network repairs and maintenance - revised operating expenditure profile**

Submission to the Authority	Costs ($000s)		
	2011/12	2012/13	% increase
Repairs and maintenance	$1,678	$2,873	71%

6.12. Corporate costs - ICT services

6.12.1. Overview of operating expenditure

The Information, Communications and Technology (ICT) group is accountable for establishing, developing and maintaining the framework and delivery of information technology (IT) services across Seqwater, including the following:

- ICT service desk
- Server and network infrastructure
- Architecture
- Applications
- Client services
- Project management office

The proposed budget for the 2012/13 reporting period is $ 12,870,544. This includes $ 4,200,448 for employee costs for 38 in-house FTEs and $ 1,845,600 for contractors.

Seqwater and WaterSecure presented separate submissions up until the current reporting period, so the forecasts for both entities need to be examined for the pre-merger years. Seqwater's "Information services" cost category has a total forecast of $ 6,586,064 ($ 2,181,984 for employee costs, $

4,404,080 for supplies and services) for 2010-11 and a total of $ 7,480,157 ($ 2,094,677 for employee costs, $ 5,385,480 for supplies and services) for 2011/12. WaterSecure's "Information technology" budget for 2011/12 was $ 3,981,155.

Combining the ICT budgets for Seqwater and WaterSecure for the 2011/12 period gives a total of $ 11,461,312.

As a result of the merger with WaterSecure, the costs of maintaining duplicate systems, supporting the changes to business processes (and resulting system changes), and then implementing changes and improvements means costs for systems and infrastructure will be higher in the short term. This has in turn created a requirement to review and develop new systems, which has had implications for staffing requirements. As a result, Seqwater's 2012/13 ICT budget is 12% higher than the sum of WaterSecure's and Seqwater's budgets for 2011/12 as shown in **Table 30**.

- **Table 30 ICT Services**

Submission to the Authority	Costs ($000s)		
	2011/12	2012/13	% increase
ICT Services	$11,461	$12,871	12%

6.12.2. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *Information Request Response to RFI ID No 0012 – ICT Overview*, Seqwater, March 2012
- *Information Request Response to RFI ID No 0012 – ICT Sections 1-5*, Seqwater, March 2012
- *Information Request Response to RFI ID No 0012 – ICT calculations spreadsheet*, Seqwater, March 2012

6.12.3. Prudency

As a whole, expenditure on ICT services is prudent as these services are required for Seqwater to meet its obligations under the Grid Contract and the SEQ System Operating Plan in a timely and cost-effective manner.

Due to the wide-ranging scope of costs and services within ICT Services, each of the five main sections of expenditure will also be assessed individually for prudency.

- Expenditure on salaries and wages is prudent, as Seqwater's options study has determined that the current system of mainly in-house delivery of ICT is the least-cost method of providing the service
- Contractor costs are prudent as it is sometimes necessary to bring in outside expertise for a limited duration on specific projects

- Telecommunications expenditure is prudent as voice, mobile, and data products and services are critical to providing the fast, modern communication which allows Seqwater to meet its obligations
- IT expenses are prudent, as this expenditure item comprises the cost of providing software and related services plus data centre back-up capability in the event of a major disaster such as another flood. The software for all of Seqwater's systems for the monitoring and control of water infrastructure and for all support systems is covered by this expenditure. This expenditure is critical to the operations of the organisation and for meeting Seqwater's Grid Contract obligations

6.12.4. Efficiency

Calculation of costs

A breakdown of costs has been provided as follows:

- Salaries and wages - $ 4,002,598
- Contractor costs - $ 1,845,600
- Telecommunications - $ 2,658,332
- IT expenses - $ 3,635,134
- Other expenses - $ 728,880

The forecast has been calculated using a bottom up method. Contractor costs are based on unit rates obtained from agencies along with an estimate of the hours required in each area. Software licenses and maintenance forecasts are calculated using a combination of actual costs from previous financial years and estimates based on previous spend. Data centre costs are largely based on values from existing contracts.

Consultant costs have been estimated as 5% of the projects budget to allow for inputs such as feasibility studies, in addition to 20 days of ad hoc consultancy.

Delivery of service

ICT is pursuing an in-house service model with a mix of permanent (38 FTEs) and contract staff with a move to replace most contractors with permanent staff over three years. The contractors will reduce to effectively zero in 2015, resulting in a planned 40 permanent FTEs for the ongoing resource complement.

This bias towards in-house delivery is due mainly to Seqwater's relatively recent investment in new high-end ICT infrastructure hardware as part of the Data Centre and Disaster Recovery Implementation Project and its long standing strategic decision to install and support the network using its own resources. The design and configuration of this equipment has been tailored to Seqwater's operation, and as such, will make outsourcing difficult. Discussions with numerous hardware vendors have failed to find anyone willing to take on this role for a reasonable price. ICT is also striving for a more customer-focused delivery of ICT services which an internal model more readily supports.

The in-house versus outsource options were examined in the internal document “ICT Organisational Design report”. It was concluded that, given the level of Seqwater’s investment in ICT infrastructure, it is more cost-effective to retain the existing arrangements for the present time.

At the same time, specific skill sets (eg infrastructure specialists and some project managers) are contracted in, on an as-required basis, and managed/hosted in-house as part of the greater ICT team. Procurement of contractors is in accordance with Seqwater’s procurement policies which align with the State Purchasing Policy.

Telecommunications services are currently provided under 3-year contracts which make use of state government agreements with Telstra. The contracts come up for renewal in July-August 2014.

Market conditions

No market conditions have been identified as being relevant to this budget forecast.

Efficiencies and economies of scale

A saving of $ 230,000 is expected by converting contractor positions into permanent positions in 2012/13. This policy is expected to produce savings of $ 1.8 million by 2015.

Benchmarking

A benchmarking study undertaken by KPMG in March 2011 presented the following benchmarks for IT and knowledge management costs as a percentage of revenue:

- Low – 1.5%
- Median – 1.66%
- High – 1.82%

These benchmarks were developed for an organisation of similar size and operating characteristics to LinkWater. While Seqwater has approximately three times the revenue of LinkWater, the operating characteristics are similar. Based on Seqwater’s revenue, the following benchmarks may be extrapolated:

- Low – $ 11.3 million
- Median – $ 12.5 million
- High – $ 13.7 million

Seqwater’s forecast total cost for the 2012/13 period ($ 12.87 million) falls near to the median reported benchmark value from the KPMG report. This suggests that Seqwater’s ICT costs are reasonable.

6.12.5. Summary

SKM considers that the expenditure is prudent because ICT and knowledge management services are required for Seqwater to meet its obligations. There has been adequate consideration of the options for in-house versus outsourced service provision.

SKM considers that the expenditure is efficient because the total cost is close to the median value of benchmarks developed by an external review.

6.13. Molendinar Water Treatment Plant – repairs and maintenance (operational)

6.13.1. Description

The repairs and maintenance operating expenditure, associated with operational requirements, component of the Molendinar Water Treatment Plant is part of the South Water Treatment operational expenditure. This item is not to be confused with the traditional repairs and maintenance that is associated with infrastructure. Seqwater has advised that this line item is concerned with the operational maintenance and therefore is concerned with cleaning and disposal of materials on site.

Seqwater has stated within their return to the Authority that the following cost components are included within this line item:

- Trade waste disposal
- Garbage pick-up
- Annual site cleaning, including hiring of the skip bins
- Contingency plan in the event of an environmental spill

SKM has reviewed the proposed operating expenditure profile for the repairs and maintenance (operational) for the Molendinar Water Treatment Plant, the information is presented in Table 31 below.

- **Table 31 Repairs and maintenance (operational) – proposed operating expenditure profile**

Submission to the Authority	Costs ($000s)		
	2011/12	2012/13	% increase
Repairs and maintenance (operational)	Not disaggregated to this level	1,289	Not able to be calculated

From **Table 31** above it can be seen that in previous submissions the operational cost was not disaggregated to this cost level. The operational budget submitted to the Authority for 2012/13 is $ 1,288,530.

6.13.2. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A11 Operational Cost Rpt – Molendinar WTP.xlsm*, Seqwater, February 2012
- *Information Request Response to RFI ID No. 0012 – Molendinar Water Treatment Plant repairs and maintenance*, Seqwater, March 2012
- *Information Request Response to RFI ID No. 0012 – Molendinar Water Treatment Plant trade waste fees calculation spreadsheet*, Seqwater, March 2012

6.13.3. Assessment of prudency

Seqwater has advised that a large component of the cost associated with this item is related to the removal and disposal of sludge from the clarifiers. At present the Molendinar water treatment plant discharges the sludge from the clarifiers into an Allconnex owned and operated waste pipeline.

For the effective operation of a water treatment plant it is a requirement that the sludge be removed at regular intervals. SKM considers that should operations fail to remove the sludge the effectiveness of the water treatment plant will decrease to a point where the quality of treated water will no longer meet the regulatory requirements.

The charges levied for the garbage collection is considered by SKM to be prudent to ensure that garbage from normal operations are removed in a social responsible manner. The annual site cleaning, including the hiring of a skip bin, of the site is considered by SKM to be a good housekeeping practice.

Seqwater has allowed for a contingency in the event of an environmental spill. Seqwater has advised that this allowance has been made based on a previous event. SKM consider it prudent to allow for an environmental spill in an application where there is a high concentration of chemicals.

SKM therefore concludes that the activities indentified under repairs and maintenance (operational) to be all related to legislative requirements of standards of service and are therefore considered prudent.

6.13.4. Assessment of efficiency

Calculation of costs

The 2012/13 forecast repairs and maintenance (operational) expenditure calculated using these reports is $ 1,288,530.

This expenditure is calculated making use of a bottom-up method. Seqwater has provided a detailed budget model with specific items in the budget and their expected cost.

The cost of items expected to increase in value over time have been adjusted making use of the default inflation rate of 2.5%, representing the midpoint in the inflation range targeted by the Reserve Bank of Australia. A contingency of $ 23,000 has been allowed for by Seqwater for in the event of an environmental spill. Seqwater has advised that "*This amount is based on experience and recent history, for instance last year an alum incident at Molendinar required pump out of clarifiers.*" SKM considers it prudent to allow for an emergency spill within the budget.

The largest cost component for this line item is the sludge discharge charges that Allconnex charge. The cost model that Seqwater has presented to SKM for review is shown in **Table 32** below.

- **Table 32 Repairs and Maintenance (Operational) cost breakdown**

Description	Cost breakdown ($)
Sludge removal (Allconnex charge)	1,263,530

Description	Cost breakdown ($)
General maintenance	
Garbage pick-up	1,500
Annual site clean	500
Contingency for clean-up of environmental spill	23,000
Total	**1,288,530**

The sludge removal cost has made use of the 2011/12 flow data and sludge quality records to estimate the cost based on the 2011/12 costing structure.

Benchmarking of costs

The table above presents the cost breakdown for the repairs and maintenance (operational) for the Molendinar Water Treatment Plant. The largest component of this cost breakdown is the sludge removal charges that Allconnex charge for the removal and treatment of the sludge. The charges that Allconnex charge to their customers are regulated by the Authority in a similar manner to that which the charges of Seqwater is regulated within this review. SKM therefore considers that the charges charged by Allconnex to be within the reason. The bottom up calculation presented by Seqwater is based on flow data and water quality from 2011/12. The costing structure used is the same as for 2011/12 with an allowance of 2.5% for inflation. SKM considers this approach used by Seqwater to conform to good industry practice in setting a budget.

Delivery of service

Although the majority of the item provides for the charges that Allconnex levy for transporting and treating the sludge from the clarifiers the other components are in relation to good housekeeping practices

SKM considers that the expenditure for the repairs and maintenance (operational) for the Molendinar Water Treatment Plant to be efficient based on the following reasons:

- The levies charged by Allconnex is regulated by the Authority and the cost estimate followed good industry practice
- The other cost components is in relation to good housekeeping practices and allowing for an environmental spill event that has a likely hood to occur in areas such as a water treatment plant that has a high concentration of chemicals within a confined area

6.13.5. Summary

SKM considers that the expenditure for the repairs and maintenance (operational) for the Molendinar Water Treatment Plant is prudent. All of the repairs and maintenance activities are required for Seqwater to fulfil its obligations in the Grid Contract, as well as regulatory compliance and legal obligations.

SKM considers the expenditure of the repairs and maintenance (operational) for the Molendinar Water Treatment Plant to be efficient.

6.14. North Pine Water Treatment Plant – Infrastructure Maintenance (Planned)

6.14.1. Description

The planned infrastructure maintenance for the North Pine Water Treatment Plant forms part of two other components that make up the total infrastructure maintenance cost for the water treatment plant. The other two components are: scheduled maintenance and unplanned maintenance.

Seqwater has indicated that the process of identifying maintenance activities is as follow: Seqwater has developed a schedule of scheduled maintenance activities that are to be undertaken. At the time of undertaking a scheduled maintenance activity, should any other maintenance activity be identified that does not appear on the schedule; the activity is brought to the attention of the Strategic Maintenance Team. All other identified maintenance activities are reviewed by the Strategic Maintenance Team and issued as planned maintenance activities, should this fit within the strategic maintenance strategy for this asset.

Seqwater has advised that the above process is due the large number of assets that was transferred as stated within the Maintenance – approach to resource allocation:

"Seqwater was transferred assets from a large number of council-owned entities, SEQWater Corp and SunWater. While the physical assets were transferred, much of the asset history was not. Moreover, the little information that was available was usually piecemeal and held in a variety of different systems, formats and asset levels. In many cases, asset management systems did not exist nor did established maintenance programs"

Although this approach is not the most efficient way to undertake maintenance SKM does consider that as a short term operational strategy this ensures that Seqwater is in a position to meet their regulatory and standards of service requirements.

SKM has reviewed the proposed operating expenditure profile for the planned infrastructure maintenance for the North Pine Water Treatment Plant; the information is presented in **Table 33**.

- **Table 33 Infrastructure maintenance (planned)**

Submission to the Authority	Costs ($000s)		
	2011/12	2012/13	% increase
Infrastructure maintenance (planned)	588	628	7%

The operational cost submitted to the Authority for 2012/13 is $ 627,535 for the planned infrastructure maintenance component at the North Pine Water Treatment Plant.

6.14.2. Provided documentation

The key reference documents used for this review are:

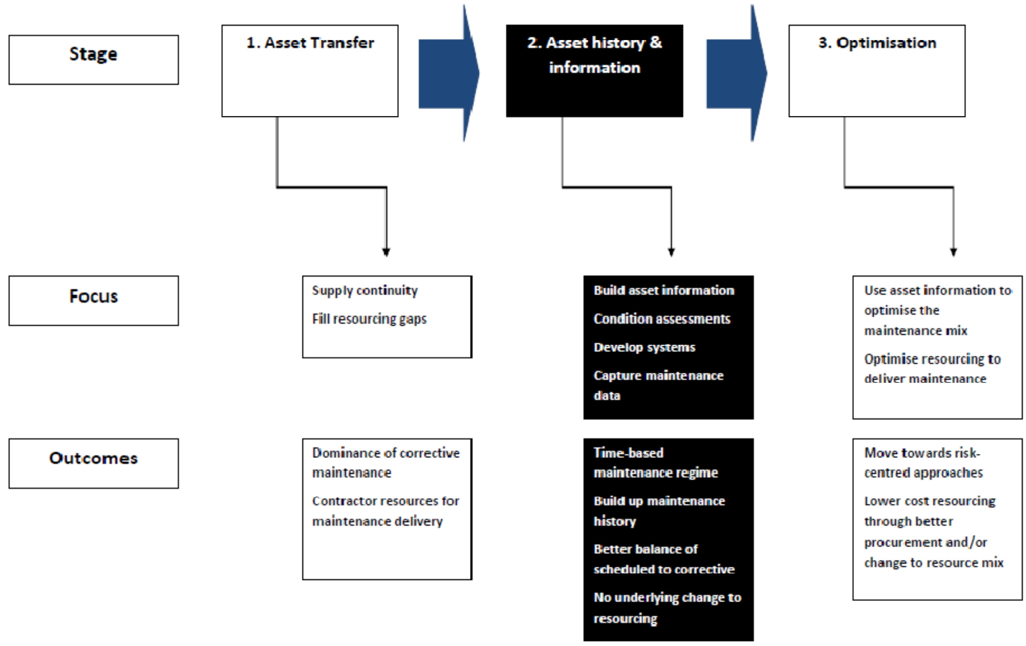
- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012

- *A10 Operational Cost Rpt – North Pine WTP.xlsm*, Seqwater, February 2012
- *Information Request Response to RFI ID No. 0012 – North Pine Water Treatment Plant planned maintenance*, Seqwater, March 2012
- *Information Request Response to RFI ID No. 0012 – North Pine Water Treatment Plant planned maintenance calculations spreadsheet*, Seqwater, March 2012
- *Information Request Response to RFI ID No. 0012 – North Pine Water Treatment Plant maintenance – approach to resource allocation*, Seqwater, March 2012
- *Information Request Response to RFI ID No. 0002 - Functions planned and unplanned maintenance*, Seqwater, February 2012
- *Information Request Response to RFI ID No. 0031 – North Pine Water Treatment Plant planned maintenance*, Seqwater, March 2012

6.14.3. Assessment of prudency

Seqwater has advised that: *"The effective and efficient maintenance of water treatment plants is central to delivering services to the Water Grid Manager and meeting Seqwater's obligations to comply with good operating practice (per section 3.7 of the Market Rules and section 10(d) of the Grid Contract"*

SKM agrees with the above statement in that to ensure the long term efficient and effective operation of water treatment plants a maintenance regime is required. SKM considers that a mature business will have strategies, policies and procedures in place to ensure that the maintenance is done in an orderly manner and able to be prioritised. Seqwater has advised that as a business they are not yet in that position and that at present they are operating within Stage 2, as set out in **Figure 8** below, and working towards operating within Stage 3.



- **Figure 8 Stages of maintenance practices**

SKM considers that should planned maintenance not be performed the operations of the infrastructure will deteriorate to a point where Seqwater will no longer be able to fulfil their regulatory requirements. On the other hand, the maintenance undertaken can ignore the age, replacement life, refurbishment life, risk profile, of an asset and spend time and effort on maintenance that is not prudent. Seqwater has indicated that all planned maintenance activities are identified during scheduled maintenance activities, further Seqwater indicated that all planned maintenance activities under goes a set process to ensure that it conforms to the strategic maintenance strategy. SKM considers this approach to satisfy the test of prudency.

SKM concludes that the planned maintenance activities for North Pine Water Treatment Plant are related to legislative requirements and standards of service. SKM considers the planned maintenance activities to be prudent.

6.14.4. Assessment of efficiency

Calculation of costs

The 2012/13 forecast planned maintenance expenditure for North Pine Water Treatment Plant has been calculated using these reports is $ 627,535.

Seqwater has stated within their submission to the Authority that two FTEs have been assigned to each of the three components making up the infrastructure maintenance cost, therefore a total of 6 FTEs has been assigned to the overall maintenance of the infrastructure. Besides the cost associated with the personnel on site the other cost components within the submission are for the repairs and maintenance and materials and consumables.

Seqwater has advised that their overarching maintenance strategy for water treatments plants is to develop their in-house managing capacity and to out-source the maintenance component. Seqwater has provided the list of staff positions and their percentage allocation to North Pine Water Treatment Plant. The staff positions and allocation is presented within **Table 34** below:

- **Table 34 Maintenance staff positions and time allocation**

Staff position	Allocation
Control systems officer	32.5%
Maintenance supervisor – Mechanical North Brisbane	32.5%
Maintenance supervisor – Civil North Brisbane	32.5%
Electrical/Instrumentation tradesperson	32.5%
Maintenance supervisor – Electrical North Brisbane	32.5%
Mechanical fitter north	32.5%

Seqwater has stated within their response to the request for information no. 0031 that: "*It is also important to note that, within Infrastructure Maintenance, it has not been possible to perfectly allocate the FTEs and labour costs across all assets as has been done for other areas in the business. This is partly a reflection of the fact that maintenance staff are in practice based at certain key locations within Seqwater's sub-regional areas and travel to perform maintenance on nearby locations, but it is predominantly the result of a deliberate decision not to over-complicate what has already been a more difficult forecasting task for 2012-13, given the new approach to forecasting maintenance based on the three way split between scheduled maintenance, planned maintenance and reactive maintenance.*" Seqwater further stated: "*It is therefore important to note that while there are certainly FTEs and labour costs reflected in the Operational Cost Report for 2012/13 for North Pine WTP, including for planned maintenance activities, these FTEs and costs reflect the maintenance activities needed for all the assets within the sub-regional area around North Pine WTP (for example, other nearby assets such as North Pine Dam, Lake Kurwongbah, Petrie WTP and Dayboro WTP)*"

SKM considers the staff allocation and roles to be appropriate for a water treatment plant of this size and being able to provide maintenance to the surrounding assets.

Seqwater has stated in the Maintenance – approach to resource allocation document as referenced above that: "*...it was determined to utilise local and regional contractors, through a panel of providers...*" SKM considers this approach to be efficient and in line with the approach that Seqwater has adopted.

Seqwater has advised within their return to the Authority that a bottom up approach was used to calculate the cost for 2012/13. The information presented by Seqwater made use of a bottom up approach in calculating the salaries and wages component, for the maintenance and repairs and labour and components part of the cost Seqwater made use of historical data.

The cost of items expected to increase in value over time have been adjusted making use of the default inflation rate of 2.5%, representing the midpoint in the inflation range targeted by the Reserve Bank of Australia. A 10% increase has been allowed for the maintenance and repairs and labour and components part and Seqwater has provided the following justification:

"10% increase to cover contractor costs due to expected increase in Panel of Providers price schedules which is being renewed in July 2012 (which include CPI plus increased panel rates) was factored to the 2011/12 budgeted expenses."

SKM considers it prudent to allow for additional increases in light of uncertainty and an expected change in market conditions.

- **Table 35 Infrastructure Maintenance – planned maintenance cost breakdown**

Description	Cost breakdown ($)
Salaries and wages	191,813
Repairs and maintenance	
Repairs and maintenance	392,150
Consumables	43,572
Total	**627,535**

The cost estimate prepared by Seqwater makes use of a proportionate approach to the maintenance required overall (planned, reactive and scheduled) based on historical actual expenditure.

SKM considers the planned maintenance to be efficient due to making use of panel contractors in undertaking the identified maintenance.

Benchmarking of costs

Seqwater has advised within their submittal that the operational cost is based on historical expenditure. The cost estimate for the total maintenance expenditure (scheduled, planned and unplanned) from 2011/12 was taken and inflated by 10% to make allowance for a cost increase to derive the total maintenance cost for 2012/13. The total maintenance cost was proportioned based on the 2011/12 proportion of 32.5% to determine the planned maintenance cost for 2012/13. At present the planned and unplanned maintenance component forms a large proportion of the maintenance expenditure, SKM considers that this percentage will decrease as Seqwater develops a better understanding of their assets maintenance requirements and makes progress with the optimisation of maintenance.

Seqwater has not provided information to enable SKM to undertake an independent prudency test on a sample of planned maintenance activities for 2011/12 for the water treatment plant. However SKM considers that this does not severely impact establishing prudency.

Delivery of service

The planned maintenance items are identified during the scheduled maintenance activities. Seqwater at present doesn't have sufficient maintenance history on most of their assets to enable an effective scheduling of all maintenance activities. Seqwater has adopted a three stage approach to identify and record and optimise the maintenance requirements for each asset. SKM considers that the planned maintenance requirement at present will be included within the scheduled maintenance required during the optimisation stage.

6.14.5. Summary

SKM considers that the cost for the planned infrastructure maintenance to be required due to legislative and level of service requirements. Seqwater has not provided sufficient information to enable SKM to consider the prudency of the previous year's planned maintenance activities. SKM does however consider that this does not impact on the consideration of prudency. Based on Seqwater following their policies and procedures in determining the requirement to undertake a planned maintenance activity SKM considers that this item is prudent and should be included in its cost.

SKM considers the planned infrastructure maintenance cost to be efficient.

6.15. Mt Crosby Westbank Water Treatment Plant – Infrastructure Maintenance (Scheduled)

6.15.1. Description

The scheduled infrastructure maintenance for the Mt Crosby Westbank Water Treatment Plant forms part of two other components that make up the total infrastructure maintenance cost for the water treatment plant. The other two components are: planned maintenance and unplanned maintenance.

Seqwater has indicated that the process of identifying maintenance activities is as follow: Seqwater has developed a schedule of scheduled maintenance activities that are to be undertaken. At the time of undertaking a scheduled maintenance activity, should any other maintenance activity be identified that does not appear on the schedule; the activity is brought to the attention of the Strategic Maintenance Team. All other identified maintenance activities are reviewed by the Strategic Maintenance Team and issued as planned maintenance activities, should this fit within the strategic maintenance strategy for this asset.

Seqwater has advised that the above process is due the large number of assets that was transferred as stated within the Maintenance – approach to resource allocation:

"Seqwater was transferred assets from a large number of council-owned entities, SEQWater Corp and SunWater. While the physical assets were transferred, much of the asset history was not. Moreover, the little information that was available was usually piecemeal and held in a variety of different systems, formats and asset levels. In many cases, asset management systems did not exist nor did established maintenance programs"

Although this approach is not the most efficient way to undertake maintenance SKM does consider that as a short term operational strategy this ensures that Seqwater is in a position to meet their regulatory and standards of service requirements.

SKM has reviewed the proposed operating expenditure profile for the planned infrastructure maintenance for the Mt Crosby Westbank Water Treatment Plant; the information is presented in **Table 36** below.

- **Table 36 Infrastructure maintenance (scheduled)**

Submission to the Authority	Costs ($000s)		
	2011/12	2012/13	% increase
Infrastructure maintenance (scheduled)	$ 462	$ 508	10%

The operational cost submitted to the Authority for 2012/13 is $ 508,280 for the scheduled infrastructure maintenance component at the Mt Crosby Westbank Water Treatment Plant.

6.15.2. Provided documentation

The key reference documents used for this review are:

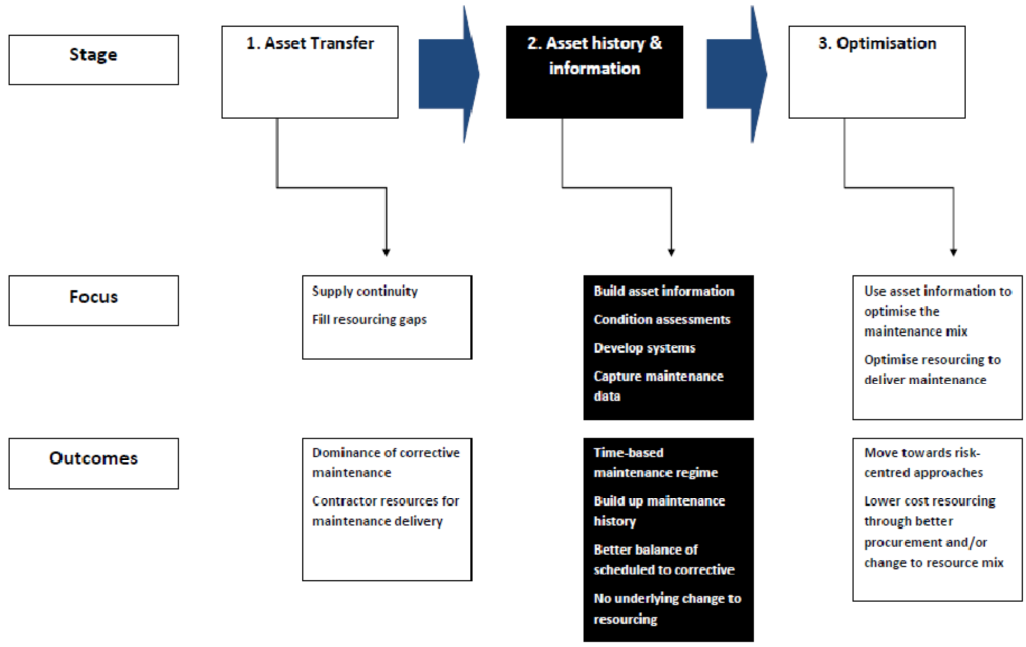
- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A19 Operational Cost Rpt – Mt Crosby Westbank WTP.xlsm*, Seqwater, February 2012
- *Information Request Response to RFI ID 0012 - Mt Crosby Westbank Water Treatment Plant scheduled maintenance*, Seqwater, March 2012
- *Information Request Response to RFI ID 0012 - Mt Crosby Westbank Water Treatment Plant scheduled maintenance calculations spreadsheet*, Seqwater, March 2012
- *Information Request Response to RFI ID No. 0012 – Mt Crosby Westbank Water Treatment Plant maintenance – approach to resource allocation*, Seqwater, March 2012
- *Information Request Response to RFI ID No. 0002 - Functions planned and unplanned maintenance*, Seqwater, February 2012
- *Information Request Response to RFI ID No. 0038 – Mt Crosby Westbank Water Treatment Plant scheduled maintenance*, Seqwater, March 2012
- *Information Request Response to RFI ID No. 0040 – Mt Crosby Westbank and EastbankWater Treatment Plant infrastructure maintenance*, Seqwater, March 2012

6.15.3. Assessment of prudency

Seqwater has advised that:*"The effective and efficient maintenance of water treatment plants is central to delivering services to the Water Grid Manager and meeting Seqwater's obligations to comply with good operating practice (per section 3.7 of the Market Rules and section 10(d) of the Grid Contract"*

SKM agrees with the above statement in that to ensure the long term efficient and effective operation of water treatment plants a maintenance regime is required. SKM considers that a fully developed business will have strategies, policies and procedures in place to ensure that the maintenance is done in an orderly manner and able to be prioritised. Seqwater has advised that as a business they are not yet in a position to optimise the maintenance requirements and that they are operating within Stage 2

(Asset history and information), as set out in **Figure 8** below, and working towards operating within Stage 3 (Optimisation).



- **Figure 9 Stages of maintenance practices**

SKM considers that should scheduled maintenance not be performed the operations of the infrastructure will deteriorate to a point where Seqwater will no longer be able to fulfil their regulatory requirements, on the reverse side the maintenance undertaken can ignore the age, replacement life, refurbishment life, risk profile, etc of an asset and spend time and effort on maintenance that is not prudent. Seqwater has indicated that all scheduled maintenance activities are identified by the Strategic Maintenance Team. Seqwater has indicated that the scheduled maintenance tasks identified are time based and has been determined by making use of the following:

- Statutory obligations (eg fire system testing) or industry standards (eg for some electrical items a voltage test is required)
- The maintenance requirements that was specified by the equipment manufacturer (OEMs)
- In the cases where none of the above was applicable the Strategic Maintenance Team relied on the experience and knowledge of the maintenance staff

Seqwater provided the schedule of scheduled maintenance activities that are to be undertaken at the Mt Crosby Westbank Water Treatment Plant. A list of ten, highest by value, scheduled maintenance items are included within **Table 37** below.

- **Table 37 Top 10 (by value) scheduled maintenance items and associated cost**

Schedule maintenance item	Cost (2012/13) ($)
Sludge Removal	33,982
Internal and External Lighting Insp	20,933
Fire Panel Equip Stat Insp	19,000
No4-Centrifuge Overhaul # 4	18,000
Lift Maintenance Electruck	15,242
Pressure Vessel External Inspection	13,000
Rubbish Removal	11,623
Air Conditioning Service	11,483
Rcd'S Testing	10,677
Test and Tag Electrical Equip	10,663

SKM notes that the sludge removal cost and rubbish removal cost has been included in the scheduled infrastructure maintenance budget and not within the repairs and maintenance (operational) budget as is the case for Molendinar Water Treatment Plant. SKM has sought clarification from Seqwater in this regard and Seqwater has advised that: "*Seqwater can confirm that the sludge residue cleaning that is budgeted within the scheduled maintenance budget at Mt Crosby Westbank WTP is a distinct and separate type of work that is not comparable to the sludge disposal that is budgeted within the water treatment operations budget for Molendinar WTP*". SKM is satisfied with the clarification provided by Seqwater and consider that there is not a double allowance made for this item.

SKM concludes that the scheduled maintenance activities for Mt Crosby Westbank Water Treatment Plant are related to legislative requirements and standards of service. SKM considers that due to all scheduled maintenance activities being identified by the Strategic Maintenance Team that the scheduled maintenance activities identified are prudent.

6.15.4. Assessment of efficiency

Calculation of costs

The 2012/13 forecast planned maintenance expenditure for Mt Crosby Westbank Water Treatment Plant has been calculated using these reports is $ 508,280.

Seqwater has stated within their submission to the Authority that no FTEs have been assigned to the infrastructure maintenance activities. SKM has sought the advice from Seqwater in this regard and Seqwater has not provided advice to SKM.

Seqwater has stated in the Maintenance – approach to resource allocation document as referenced above that: *"...it was determined to utilise local and regional contractors, through a panel of providers..."* SKM considers this approach to be efficient and in line with the approach that Seqwater has adopted. Seqwater further states within the Planned and unplanned maintenance document, as referenced above, that: "*As set out above, most of Seqwater's maintenance tasks are outsourced with some 49 contractors (drawn from a panel of providers) performing maintenance services full time at some sites, and other contractors employed on an as-needs basis depending on work loads.*"

Seqwater has advised within their return to the Authority that a bottom up approach was used to calculate the cost for 2012/13. The information presented by Seqwater made use of a bottom up approach in calculating the cost for the various scheduled maintenance activities. Seqwater stated within the Information Request Response 2012/13, as referenced above, the following:

"*Cost associated with Scheduled Maintenance are the total of each item of maintenance scheduled to occur within the relevant period from Seqwater's single asset management system within the Corporate Information System (CIS). CIS produces work orders for each asset, including the Mt Crosby Westbank WTP, to initiate scheduled maintenance jobs. The work orders contain work instructions for each maintenance task.*"

Seqwater has allowed for a 10% increase and has stated that this increase is to allow for the fact that the Panel of Providers price schedules will be renewed/ renegotiated in July 2012 and Seqwater indicated that the market has changed and that this increase will enable the contractors to cover for the cost increases.

SKM considers it prudent to allow for additional increases in light of uncertainty and an expected change in market conditions.

- **Table 38 Infrastructure maintenance – planned maintenance cost breakdown**

Description	Cost breakdown ($)
Repairs and maintenance	
Repairs and maintenance	457,452
Consumables	50,828
Total	**508,280**

The cost estimate prepared by Seqwater, as presented in **Table 38** above, has allowed 90% of the total scheduled maintenance cost to be allocated to repairs and maintenance and 10% to materials and consumables.

SKM considers the scheduled maintenance to be efficient due to making use of panel contractors in undertaking the identified maintenance. SKM does however note that no allowance has been made by Seqwater within the infrastructure maintenance cost for internal staff to manage the process. SKM has sought clarification on this and Seqwater has advised that: "*Under the sub-regional approach followed, a labour budget of $1,740,119 is allocated to Mt Crosby Eastbank WTP which covers nearby asset locations including Mt Crosby Westbank WTP*". The clarification addresses SKMs concerns and SKM considers this approach taken by Seqwater to have been applied across the entity.

Benchmarking of costs

The cost estimate prepared by Seqwater makes use of a bottom up approach where each scheduled item is listed and a cost assigned to it. Seqwater has stated within the Maintenance – approach to resource allocation, as referenced above, that where possible they make use of a Panel Contractor to perform maintenance activities. SKM considers this approach to efficient in that the market has set the price for the items.

Delivery of service

The scheduled maintenance items have been identified by the Strategic Maintenance Team making use of the 3 criteria as stated above. The scheduled maintenance activities the absolute minimum maintenance required to meet direct regulatory requirements and warranty requirements. SKM considers that as Seqwater acquires a better understanding of their assets maintenance requirements more planned items will become scheduled items and therefore a decrease of planned items will be experienced.

6.15.5. Summary

SKM considers that the cost for the scheduled infrastructure maintenance to be required due to legislative and level of service requirements. Based on Seqwater following their policies and procedures in determining the requirement to undertake a scheduled maintenance activity SKM considers that this item is prudent and should therefore be included.

SKM considers the planned infrastructure maintenance cost to be efficient.

6.16. Hinze Dam – maintenance - repairs and maintenance (catchment management and maintenance)

6.16.1. Description

The maintenance - repairs and maintenance operating expenditure, associated with catchment management and maintenance requirements, component of the Hinze Dam is part of the catchment management and maintenance expenditure. This item is not to be confused with the traditional repairs and maintenance that is associated with infrastructure, this line item is concerned with the operational maintenance and therefore is concerned managing and maintaining the catchment area.

Seqwater has stated that the following cost components are included within this line item:

- Fire management
- Grounds maintenance
- Pest maintenance
- Aquatic weed management
- Terrestrial weed management

SKM has reviewed the proposed operating expenditure profile for the repairs and maintenance (catchment management and maintenance) for the Hinze Dam, the information is presented in **Table 39** below.

- **Table 39 Repairs and maintenance (catchment management and maintenance) – proposed operating expenditure profile**

Submission to the Authority	Costs ($000s)		
	2011/12	2012/13	% increase
Repairs and maintenance (catchment	217	491	126%

Submission to the Authority	Costs ($000s)		
	2011/12	2012/13	% increase
management and maintenance)			

The operational cost submitted to the Authority for 2012/13 is $ 490,717.

6.16.2. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A24 Operational Cost Rpt – Hinze Dam.xlsm*, Seqwater, February 2012
- *Information Request Response to RFI ID No. 0012 – Hinze Dam catchment management repairs and maintenance*, Seqwater, March 2012
- *Hinze Dam Stage 3 Condition Report – Compensatory Habitat Strategy*, Hinze Dam Alliance, 3 February 2012
- *Information Request Response to RFI ID No. 0042 – Hinze Dam catchment management*, Seqwater, March 2012

6.16.3. Assessment of prudency

Seqwater has stated within the Information Request Response, as referenced above, that:

"Catchment management is inextricably entwined with the functions required to manage water storages and supply treated drinking water."

SKM agrees with the above statement in that almost all of the water that is stored within a dam is from the run-off within the catchment area. It therefore make sense to ensure that effort and therefore money is put towards maintaining the catchment to assist with keeping the water stored in the best possible condition.

Seqwater further put forward the following reasons to undertake the catchment management activities within the Information Request Response, as referenced above:

- *"Seqwater must comply with regulatory obligations to meeting drinking water quality standards and specifically to undertake catchment management;*
- *there is a community expectation that Seqwater will manage the quality of water supplied from its storage and treatment assets, particularly given recent changes to the water quality profile (including increasing pressure on catchment land and the potential introduction of purified recycled water to the drinking water supply system);*
- *the active management of catchment and water storage areas is an efficient manner by which to minimise the potential impacts and risks to water quality outcomes (the multi-barrier treatment approach);*

- *Seqwater must comply with legislative obligations relating to environmental protection, conservation, cultural heritage protection and other land laws, where compliance would otherwise not be possible without effective catchment management;*
- *for historical reasons, such as the previous Council ownership and the longstanding public access and use of many water storages, there are significant community expectations relating to continuing access to catchments, so effective catchment management is required to best manage the risks to public safety, from a land access perspective, given community demand for access is so strong; and*
- *catchment management considerations are inseparable from other ownership obligations that are reflected in the legal and regulatory environment governing the ownership and management of these assets, for example*
  - *Land Protection Act 2002 – for the management of declared animal and pest species;*
  - *Land Act 1994 and QFRS Act 1994 – for fire management; and*
- *in the Coordinator-General's conditions for developing new water storages (such as Wyaralong and Hinze Dams)"*

SKM agrees with all the arguments and reasons that Seqwater has raised above.

Seqwater further makes reference to a Ministerial Direction to the Authority in relation to the 2011/12 grid service charges review in which the Authority was instructed to consider the catchment management activities as prudent.

SKM therefore concludes that the activities identified under repairs and maintenance (catchment management) to be all related to legislative requirements and are therefore considered prudent.

6.16.4. Assessment of efficiency

Calculation of costs

The 2012/13 forecast repairs and maintenance (catchment management) expenditure calculated using these reports is $ 490,717.

Seqwater has advised within the Information Request Response, as referenced above, that the budget has been compiled by building up by activity, by location and based on historical work order information. A cost breakdown of Seqwater's cost build up is provided within **Table 40**.

- **Table 40 Repairs and maintenance (catchment management) cost breakdown**

Description	Cost breakdown ($)
Fire management	30,000
Grounds maintenance	
Lyons property maintenance	30,000
Compensatory habitat maintenance	239,000
Erosion control works	10,000
Land management for Hinze catchment	55,000
Pest management	10,000
Aquatic weed management	0
Terrestrial weed management	117,000
Total	**490,717**

Seqwater has broken down the expected cost for the Compensatory habitat maintenance into the following components:

- Independent specialist - $ 3,000
- Site management consultancy including the weed, revegetation, monitoring and reporting - $ 200,000
- Bushland restoration services - $ 11,000
- NES backup pool contractor - $ 4,000
- Fire management contractor - $ 20,000

Benchmarking of costs

Seqwater has provided information to the reason/s for the expected increase of cost for the catchment management. The information provided by Seqwater shows that the increase in cost is to be ascribed to the additional requirements of the compensatory habitat maintenance.

The Hinze Dam Stage 3 Condition Report, referenced above, draws reference to the Coordinator General's conditions 1a and 1b. The following is the Coordinator General's Condition 1a as stated within the Hinze Dam Stage 3 Condition Report, referenced above:

"Condition 1a: Compensatory Habitat Strategy

The Proponent will implement and undertake a Compensatory Habitat Strategy to offset the loss of approximately 318ha of mapped remnant vegetation that will occur as a result of the project works.

The Compensatory Habitat Strategy must involve the following actions in relation to at least 318 ha:

- *the acquisition (and management) of freehold land containing advanced regrowth or remnant vegetation (or the potential to support remnant vegetation), ideally within the Gold Coast area;*
- *transfer of the acquired freehold land to State tenure with local government management or to local government tenure and management;*

- *translocation and propagation of affected NES species within parts of the above areas and/or Lot 4 SP164198 so that there is no net loss of these NES species (noting that any land used within Lot 4 SP164198 for these actions is not to be accounted as part of the 318 ha that must be acquired to satisfy the wider Strategy outcomes);*
- *revegetation and rehabilitation of existing cleared or disturbed areas within non-privately owned land within and adjacent to the study area.*

If the proponent identifies, and demonstrates to the satisfaction of the Coordinator-General, practical difficulties in achieving the above actions in relation to at least 318 hectares of land, it may propose a suitable contribution of funds into the Queensland Trust for Nature Fund (administered by the EPA) or other green invest broker, to secure a proportion of the necessary offset outcome.

The Compensatory Habitat Strategy is to target no net loss to flora species, and no net loss of habitat for fauna species, listed as endangered, vulnerable or rare (EVR) under the EPBC Act or endangered under the NCA, taking account of the positive and negative impacts of the dam construction and operation and the implementation of the offset actions."

SKM considers that the above condition satisfactorily demonstrates the increase in the maintenance requirements for the Hinze Dam catchment management and maintenance item.

Seqwater has further indicated that they expect a $25,000 increase in cost due to terrestrial weeds maintenance at Little Nerang that was not part of the 2011/12 cost allocation.

Delivery of service

Seqwater has indicated that 100% of the proposed tasks are to be performed by external parties. Seqwater has a panel of panel contractors that is used to undertake these tasks. The Panel Contract has been let in accordance with Seqwater's procurement policies and procedures. Should an instance arise where no suitable qualified panel contractor be available Seqwater has indicated that they follow their procurement policy and procedures to secure the services of a suitable qualified contractor.

SKM considers that the expenditure for the repairs and maintenance (catchment management) for the Hinze Dam to be efficient based on the following reasons:

- The panel contract has been let in accordance to Seqwater's procurement policy and procedures
- The additional maintenance requirements and associated cost that the compensatory habitat strategy imposes on Seqwater

6.16.5. Summary

SKM considers that the expenditure for the repairs and maintenance (catchment management) for the Hinze Dam is prudent and should therefore be included. All of the repairs and maintenance activities are required for Seqwater to fulfil its obligations in the Grid Contract, as well as regulatory compliance and legal obligations.

SKM considers the expenditure of the repairs and maintenance (catchment management) for the Hinze Dam –to be efficient at $ 490,717.

6.17. Tugun Desalination Plant – Water quality monitoring

6.17.1. Description

The Tugun Desalination Plant has been procured by the then Watersecure making use of a build operate and transfer (BOT) procurement method. A joint venture between Veolia Water and John Holland Australia, trading as GCD Alliance was awarded the contract. This contract provides for a 10 year term from the commissioning completion date of 24 September 2010 under a Total Operating Cost (TOC) structure based on 100% utilisation of the plant production. Seqwater stated that: "*The contract operates on a cost plus basis, with actual costs reimbursed to Veolia Water plus a margin.*"

Veolia Water operates the plant on behalf of GCD Alliance and Seqwater has indicated that most of the testing is outsourced including:

- Routine testing of feed water (sea water) and water at various stages of production. This testing is undertaken by Brisbane Water Technologies
- Testing required for environmental monitoring. Within this category of testing GCD Alliance has a contract with FRC Environmental to undertake routine marine monitoring

SKM has reviewed the proposed operating expenditure profile for the water quality monitoring for the Tugun Desalination Plant, the information is presented in **Table 41** below

- **Table 41 Water quality monitoring – proposed operating expenditure profile**

Submission to the Authority	Costs ($000s)		
	2011/12	2012/13	% increase
Water quality monitoring	502	520	4%

The operational cost submitted to the Authority for 2012/13 is $ 520,040 for water quality monitoring at the Tugun Desalination Plant.

6.17.2. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A29 Operational Cost Rpt – Gold Coast Desalination Plant.xlsm*, Seqwater, February 2012
- *Information Request Response to RFI ID No. 0012 – GCDP Water quality monitoring*, Seqwater, March 2012
- *Information Request Response to RFI ID No. 0012 – GCDP Water quality monitoring calculations spreadsheet*, Seqwater, March 2012

6.17.3. Assessment of prudency

Seqwater has stated within the Information Request Response, as referenced above, that the water quality monitoring requirement is driven by the following three factors:

- Grid contract and general compliance
- Forecast supply under the Water Grid Managers operating strategy
- Standard of service

Seqwater has stated that within the development approval (Reference: SPDE02043211) for the Tugun Desalination Plant that it requires a testing regime for the following streams:

- Water discharged to the environment
- Waters in the receiving environment
- Groundwater
- Landfill gas
- Marine ecosystem monitoring

Seqwater has stated within the Information Request Response, referenced above, that the Water Grid Manager forecast is for the Tugun Desalination Plant to operate in hot standby mode for 39 weeks and to produce water for the remaining 13 weeks of 2012/13. Seqwater further stated that under the Water Grid Managers operating strategy Seqwater is required to be able to deliver water within 24 hours during hot standby mode and that certain water quality tests require three days turnaround. Seqwater argues that this imply that Seqwater is not afforded a reduced testing regime. SKM understands that the requirement for a 24 hour lead-in time is a Ministerial Direction and is therefore considered by SKM to be prudent as SKM agrees that this testing regime is the only way of ensuring that this strict timeframe can be complied with.

Seqwater has also indicated that they are required to adhere to the SEQ Water Grid Quality Management Plan that where developed by the Water Grid Manager under the SEQ Water Market Rules. The SEQ Water Grid Quality Management Plan sets out how water quality is managed and monitored across the SEQ Water Grid to ensure that the water quality continuous to comply to the relevant Australian standards. Seqwater further indicated that a Drinking Water Quality Management Plan has been drafted for the Tugun Desalination Plant and has been approved by the Water Supply Regulator within the Department of Environment and Resource Management in June 2011.

SKM concludes that the water quality monitoring operating expenditure for the Tugun Desalination Plant is due to legislative requirements and standards of service and therefore SKM considers that this item is prudent.

6.17.4. Assessment of efficiency

Calculation of costs

The 2012/13 forecast water quality monitoring expenditure for Tugun Desalination Plant has been calculated using these reports is $ 520,040.

Seqwater has made use of zero base (2010/11) cost estimate to estimate the cost. In preparing the cost estimate Seqwater has differentiated between the testing required during hot standby mode and the testing required during normal operations. The Water Grid Manager has forecasted that during the 13 weeks of requiring water to be supplied from the Tugun Desalination Plant will be at 33% and 66% of production. Seqwater has therefore made an allowance for an equivalent six weeks at 100% production for estimating the cost component of the water quality tests required during normal operations. SKM considers this approach adopted by Seqwater to be efficient. The cost breakdown that Seqwater has provided to SKM is show in **Table 42** below as well as the SKM cost breakdown.

- **Table 42 Water quality monitoring – cost breakdown**

Description	Zero base cost (2010/11) ($)	Cost breakdown (2012/13) ($)	SKM cost breakdown ($)
Hot standby external analyses – Brisbane Water Laboratories	93,906	100,205	100,205
External analyses - tanks	50,000	53,354	53,354
Internal analyses – 6 week equivalent	43,792	46,730	
Environmental analyses	299,641	319,741	319,741
Hot standby internal analyses	32,363		34,534
Internal analyses – Normal operations (6 weeks)	11,430		12,196
Total		**520,030**	**520,030**

Seqwater has made use of 3% and 3.6% to allow adjusting the cost from 2010/11 to 2011/12 and 2011/12 to 2012/13 respectively. The percentages are based on the agreed negotiated cost adjustments agreed to between Seqwater and GCD Alliance.

Seqwater has advised SKM, in relation to the allowance for the external analyses of the tanks, that: "*The $50,000 is a contingency amount relating to an established ad hoc need for further external lab costs for potable water tanks. The contingency is needed as there has been ongoing issues with the current external lab for this particular set of testing. The incumbent lab has at times, produced unreliable results and the contingency is in place to provide further budget for the use of a second laboratory. The current lab in Brisbane charges $30 per test whereas the second / back-up lab charges $240 per test but must nonetheless be called upon from time to time to ensure validity of test results.*" SKM is satisfied that this contingency allowance is an efficient way of undertaking water quality monitoring.

SKM considers the water quality monitoring to be efficient based Seqwater demonstrating that the cost involved has been determined by the market in 2010/11 and has adjusted to make allowance for the increase in costs.

Benchmarking of costs

The largest cost component ($ 232,487 of $ 319,741) of the environmental analyses, as shown in **Table 42** above, is the routine marine monitoring that is provided by FRC Environmental.

Seqwater has advised within the Information Request Response, referenced above, that: "*Seqwater scrutinised Veolia Water's procurement practices and was satisfied this supplier represented the best value for money. FRC Environmental have just completed their first year of monitoring. The option to extend this contract for a further one year is currently being finalised.*" SKM consider it prudent that Seqwater has scrutinised the procurement practices that Veolia Water has followed in setting up the external contracts with service providers for water quality monitoring.

Seqwater has provided SKM with a full list of all the type of tests that are undertaken and the number of test per year required. The cost per test has been provided and varies considerable. SKM considers that a relative large sample would be required to be tested to determine the efficiency of the overall testing cost. SKM does however consider that in light of the cost plus basis of the contract between Seqwater and GCD Alliance and that Seqwater has scrutinised the procurement process of Veolia Water, as described above, SKM considers that the overall cost of the testing is efficient.

Delivery of service

SKM is of the view that there is a more efficient way in dealing with the requirement of ensuring that a 24 hour lead in time to the supply of water to the grid can be achieved. As discussed above Seqwater is required to undertake daily test of which the results are only available within three days after the test were conducted. SKM considers that the requirement to be able to supply water to the grid within 24 hours is a water grid risk mitigation measure.

In considering the SEQ Water Grid, SKM realises that should the Mt Crosby Eastbank and Westbank Water Treatment Plants experience a catastrophic failure the Tugun Desalination Plant will be capable to supply water for a short duration to provide water to the water grid, while supply from the Mt Crosby Eastbank and Westbank Water Treatment Plants are restored. The Tugun Desalination Plant will be able to supply water to the water grid for an extended period should one of the other water treatment plants require maintenance or experience a catastrophic failure.

SKM considers it prudent that a risk assessment and subsequent dialogue be undertaken to challenge the *status quo* and argue for a reduced requirement in terms of lead in time and therefore the testing requirements.

6.17.5. Summary

SKM considers that the cost for the water quality monitoring to be required due to a Ministerial Direction and SKM therefore consider the item to be prudent and should therefore be included.

SKM considers the water quality monitoring cost of $520,040 submitted to the Authority to be efficient.

6.18. Overall Summary

A sample of fifteen projects were identified and assessed as a representative sample of the operating expenditure program for 2012/13 for Seqwater. We have assessed these projects against the Authority's definitions of prudency in particular the relevant driver and the decision making process and efficiency, including the standards of service, scope of work, timeliness of delivery and the costs.

The operational expenditure of twelve of the fifteen operational expenditure projects were assessed as both prudent and efficient.

For one of the operational expenditure projects, Bundamba Advanced Water Treatment Plant Employee Expenses, there was insufficient information to assess all of the expenditure as efficient.

The Corporate Costs - People and Culture project was assessed as prudent and efficient in all areas except for the efficiency of recruitment fees and the Pipeline Network - Repairs & Maintenance project was assessed as prudent but only partially efficient.

Table 43 presents a summary of the assessment of prudency and efficiency for the sample of operating costs.

- **Table 43 Summary of prudency and efficiency of operating costs ($000s)**

Operating Expenditure item		Asset	Value $000s (2012/13)	Prudent	Efficient
1	Catchment Management & Maintenance - Salaries and Wages - Awards + Repairs & Maintenance	Wivenhoe Dam	746	Prudent	Efficient
2	Dam and Source Ops - Employee costs	North Pine Dam	342	Prudent	Efficient
3	Employee Expenses	Bundamba AWTP	2,419	Prudent	Insufficient information to assess all expenditure as efficient
4	People and Culture	Corporate Costs	4,350	Prudent	Expenditure efficient except recruitment fees
5	Electricity	Mt Crosby Eastbank WTP	2,503	Prudent	Efficient
6	Treatment Chemicals	Landers Shute WTP	1,315	Prudent	Efficient
7	Electricity	Luggage Point AWTP	1,652	Prudent	Efficient
8	Repairs & Maintenance	Gold Coast Desalination Plant	5,167	Prudent	Efficient
9	Repairs & Maintenance	Pipeline Network	2,997	Prudent	Partially efficient
10	ICT Services	Corporate Costs	12,871	Prudent	Efficient
11	Repairs & Maintenance	Molendinar WTP	1,289	Prudent	Efficient
12	Infrastructure Maintenance -	North Pine WTP	628	Prudent	Efficient

	Operating Expenditure item	Asset	Value $000s (2012/13)	Prudent	Efficient
	Planned				
13	Infrastructure Maintenance - Scheduled	Mt Crosby Westbank WTP	508	Prudent	Efficient
14	Catchment Management & Maintenance - Repairs & Maintenance	Hinze Dam	491	Prudent	Efficient
15	Water Quality Monitoring	Gold Coast Desalination Plant	520	Prudent	Efficient

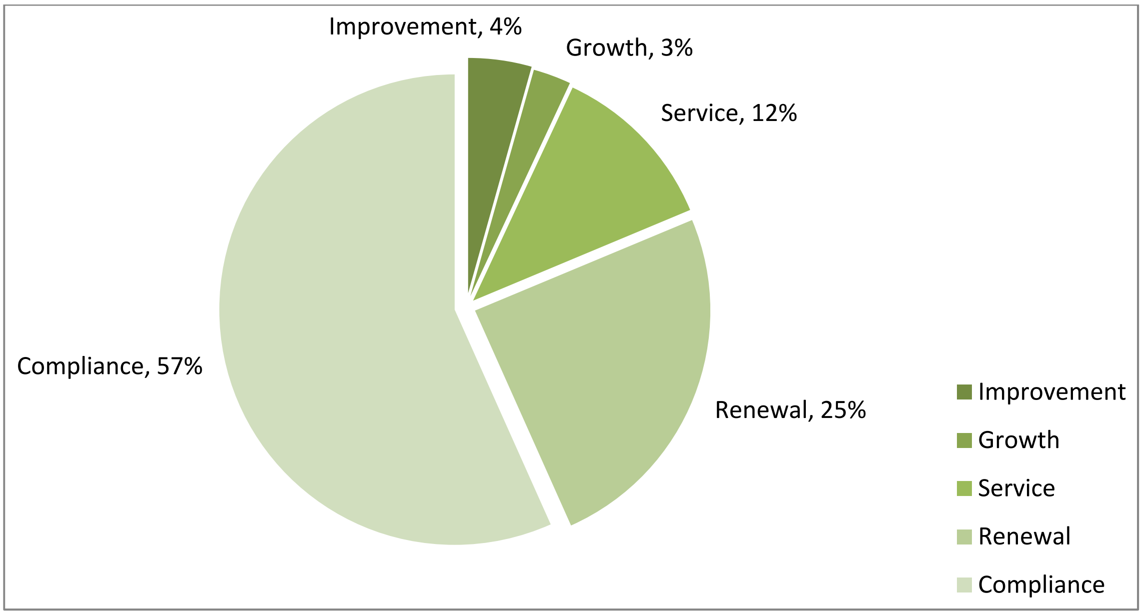
7. Capital expenditure 2012/13

This section contains the review of the prudency and efficiency of Seqwater's capital expenditure. The section is structured as follows:

- Overview of Seqwater's capital expenditure for 2012/13
- SKM's sample selection process
- Overview of prudency and efficiency reviews of Seqwater's capital expenditure
- Detailed prudency and efficiency reviews of the selected sample
- Summary and recommendations

7.1. Overview of capital expenditure

The breakdown of Seqwater's proposed capital expenditure for the 2012/13 financial year by their nominated cost drivers can be seen in **Figure 10**. Just over half of this expenditure is attributed to 'compliance', with a large share of expenditure also related to 'renewal' activities. This is in response to the poor condition of inherited assets and the needs identified following the January 2011 flood.



Source: Seqwater 2012-2013 GSC Information Return Capex 2012/13 spreadsheet

- **Figure 10 Cost driver comparison of Seqwater's capital expenditure**

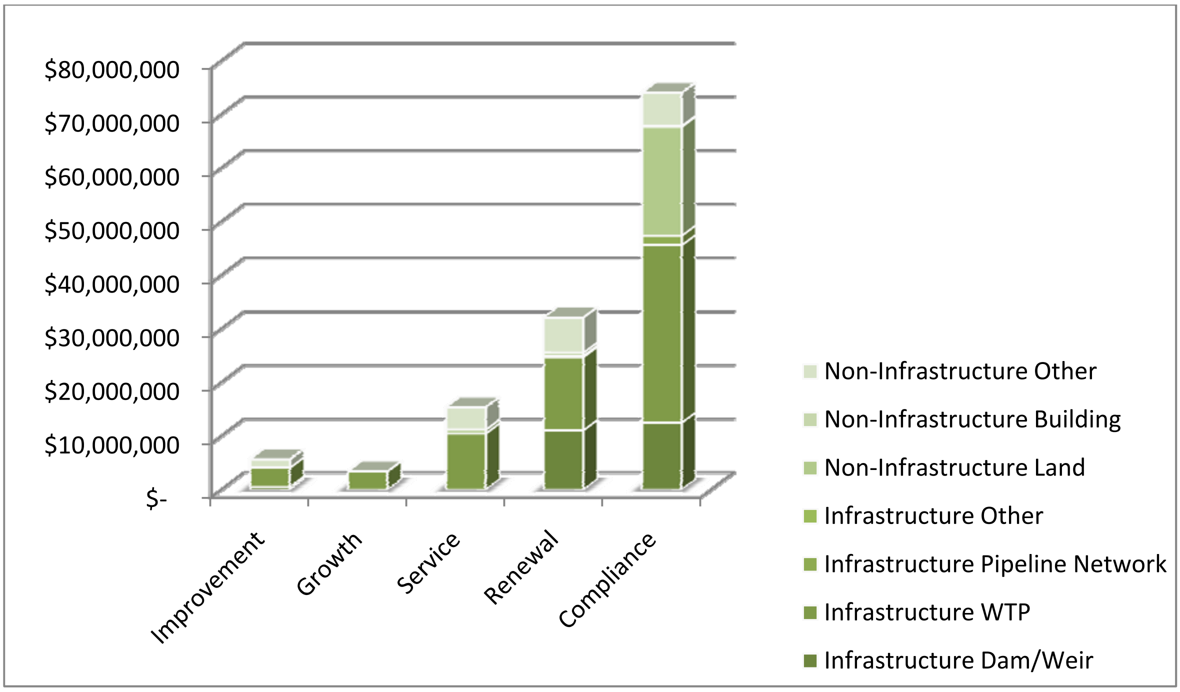
Table 44 identifies the expenditure in this submission for the financial years from 2011/12 to 2016/17 which is associated with each of the cost drivers nominated by Seqwater. A review of the table indicates that for the capital expenditure projects in this submission the greatest expenditure is consistently attributed to compliance followed by renewal up until the financial year 2016/17. The greatest spending on the projects in this submission is focussed in the financial years 2012/13 – 2014/15.

Table 44 Forecast capital expenditure by cost driver ($000s)

Cost driver	Cost ($000s)				
	2012/13	2013/14	2014/15	2015/16	2016/17
Business Efficiency	5,680	10,250	10,000	10,000	10,000
Growth	3,400	6,600	4,000	1,000	0
Service	15,337	7,472	5,295	4,632	3,877
Renewal	32,132	18,824	14,820	14,930	14,960
Compliance	74,009	63,863	62,029	34,189	6,059
Total	**130,557**	**107,009**	**96,144**	**64,751**	**34,896**

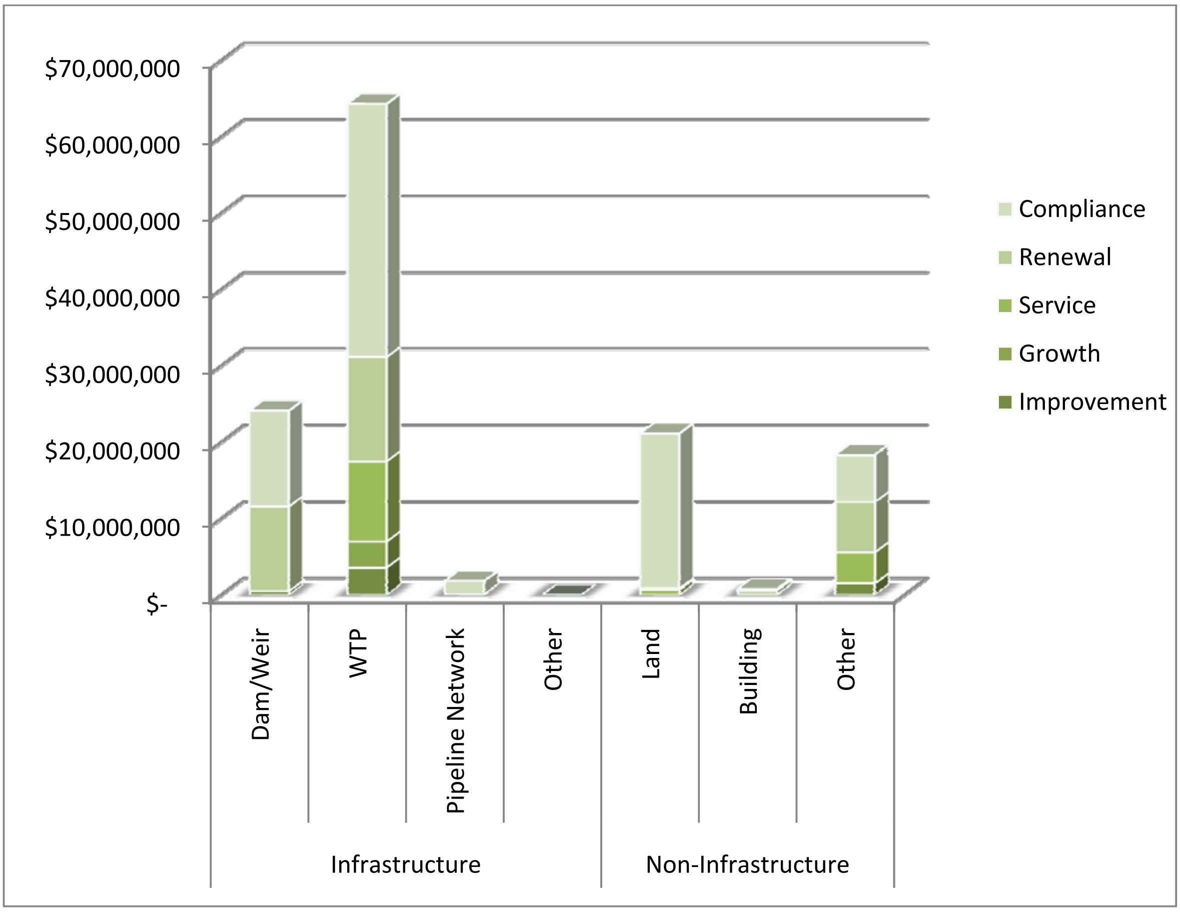
Source: Seqwater 2012-2013 GSC Information Return Capex 2012/13 spreadsheet

Figure 11 and **Figure 12** show that the main drivers of Seqwater's capital expenditure are compliance and renewal. A high proportion of Seqwater's capital expenditure is dedicated to improving the performance and compliance of inherited treatment plant assets.



Source: Seqwater 2012-2013 GSC Information Return Capex 2012/13 spreadsheet

Figure 11 Seqwater forecast capital expenditure for 2012/2013 by cost driver



Source: Seqwater 2012-2013 GSC Information Return Capex 2012/13 spreadsheet

- **Figure 12 Seqwater forecast capital expenditure for 2012/2013 by asset type**

7.2. Cost drivers

The Authority required that to assess the prudency of capital expenditure, Seqwater must attribute one or more of the following drivers to the capital expenditure projects submitted:

- *Growth* - capital expenditure designed to provide an increase in the capacity or capability of an asset in response to increased demand, growth or variations required by a customer
- *Service* - capital expenditure associated with upgrading service outcomes to improve asset efficiency; reliability or increase the anticipated life of an asset to prevent a service non-compliance or capacity shortfall
- *Compliance* - capital expenditure associated with the replacement and or enhancement of an asset to prevent a non-compliance with legislative requirements such as the Water Act, Water Market Rules, Grid Services Contract, Water Quality Guidelines and OH&S
- *Renewal* - capital expenditure associated with the replacement and or enhancement of an asset that is currently compliant with service performance standards and legislative requirements but faces an unacceptable risk of future non-compliance. The renewal will maintain existing levels of service over the life cycle of the asset

- *Improvement* - capital expenditure designed to improve operational efficiency and reduce ongoing costs

7.3. Sample selection

As part of this analysis, a sample of the capital expenditure projects from the 2012/13 budget have been analysed in detail in terms of their prudency and efficiency. The initial capital expenditure sample selection chosen in consultation with the Authority for detailed analysis is shown below in **Table 45**.

- **Table 45 Initial 2012/13 capital expenditure project selection ($000s)**

Project	Driver	Cost ($000s)		
		2011/12	2012/13	2013/14-2016/17
Flood Damage Assessment and Repairs	Renewal	6,600	9,848	2,954
Kilcoy WTP - New WTP Works	Service	6,578	8,353	1,217
Maroon Dam - Stage 1 Safety Upgrade	Compliance	250	4,000	3,000
Jimna WTP - Upgrade Works	Compliance	250	1,661	-
Margaret St - Business Driven Projects from ICT Ops Plan Plant & Equipment	Compliance	-	1,700	16,074
NSI WTP - Lime System & Sludge Lagoon	Improvement	-	2,000	9,165
Gold Coast Desalination Plant - R&M-Asset Replacement	Renewal	-	3,812	-
Gold Coast Desalination Plant - Pressure Threaded Connections	Compliance	-	2,312	-
Gold Coast Desalination Plant - Autoflush of SAF Pumps and Headers	Compliance	-	1,075	3,000
Lowood WTP - Sludge Handling Improvements and Other Works	Compliance	300	2,000	1,000
Molendinar WTP - Upgrade Works	Compliance	-	2,000	9,715
Mudgeeraba WTP - Upgrade Works	Compliance	-	1,975	-
Mt Crosby Eastbank & Westbank WTPs - Chemical Systems Upgrade	Compliance	3,769	24	-
Mt Crosby Eastbank WTP - Holts Hill Chlorine Control Building Foundation Repairs	Service	609	1,654	-
Total Sample (14 projects)		**18,356**	**42,414**	**46,125**
Percentage of total 2012/13 capital expenditure		-	**32%**	-

Preliminary investigation identified that the Gold Coast Desalination Plant - Pressure Threaded Connections was a drought project and therefore not valid for review and that the Mt Crosby Eastbank and Westbank water treatment plants - Chemical Systems Upgrade was included in the 2011/12 sample review, as they have different names. These projects were replaced by the Beaudesert Water Treatment Plant Upgrade Works and the Boonah Kalbar Water Treatment Plant - Plant Automation /Pipeline Upgrade projects. The final sample list is provided in **Table 46**.

Table 46 Final 2012/13 capital expenditure project reviewed ($000s)

Project	Driver	Cost ($000s)		
		2011/12	2012/13	2013/14-2016/17
Flood Damage Assessment and Repairs	Renewal	6,600	9,848	2,954
Kilcoy WTP - New WTP Works	Service	6,578	8,353	1,217
Maroon Dam - Stage 1 Safety Upgrade	Compliance	250	4,000	3,000
Jimna WTP - Upgrade Works	Compliance	250	1,661	-
Margaret St - Business Driven Projects from ICT Ops Plan Plant & Equipment	Compliance	-	1,700	16,074
NSI WTP - Lime System & Sludge Lagoon	Improvement	-	2,000	9,165
Gold Coast Desalination Plant - R&M-Asset Replacement	Renewal	-	3,812	-
Gold Coast Desalination Plant - Autoflush of SAF Pumps and Headers	Compliance	-	1,075	3,000
Lowood WTP - Sludge Handling Improvements and Other Works	Compliance	300	2,000	1,000
Molendinar WTP - Upgrade Works	Compliance	-	2,000	9,715
Mudgeeraba WTP - Upgrade Works	Compliance	-	1,975	-
Mt Crosby Eastbank WTP - Holts Hill Chlorine Control Building Foundation Repairs	Service	609	1,654	-
Beaudesert WTP Upgrade Works	Growth	-	2,500	6,500
Boonah Kalbar WTP Plant Automation / Pipeline Upgrade	Compliance	300	2,500	6,500
Total Sample (14 projects)		**14,887**	**45,078**	**59,125**
Percentage of total 2012/13 capital expenditure		-	**35%**	-

The sample has been selected based on the overall value of costs within the 2012/13 budget and to be representative of the various categories of costs. The review has focused on projects that are forecast to be commissioned in 2012/13, as subsequent to commissioning they would be added to the RAB.

Table 47 Final 2012/13 capital expenditure project reviewed - asset type

Project	Asset type	2012/13 Cost ($000s)
Flood Damage Assessment and Repairs	Dam/ Weir	9,848
Kilcoy WTP - New WTP Works	WTP	8,353
Maroon Dam - Stage 1 Safety Upgrade	Dam/ Weir	4,000
Jimna WTP - Upgrade Works	WTP	1,661
Margaret St - Business Driven Projects from ICT Ops Plan Plant & Equipment	Other	1,700
NSI WTP - Lime System & Sludge Lagoon	WTP	2,000
Gold Coast Desalination Plant - R&M-Asset Replacement	WTP	3,812
Gold Coast Desalination Plant - Autoflush of SAF Pumps and Headers	WTP	1,075
Lowood WTP - Sludge Handling Improvements and Other Works	WTP	2,000
Molendinar WTP - Upgrade Works	WTP	2,000
Mudgeeraba WTP - Upgrade Works	WTP	1,975
Mt Crosby Eastbank WTP - Holts Hill Chlorine Control Building Foundation Repairs	WTP	1,654
Beaudesert WTP Upgrade Works	WTP	2,500

Project	Asset type	2012/13 Cost ($000s)
Boonah Kalbar WTP Plant Automation / Pipeline Upgrade	WTP	2,500
Total Sample (14 projects)		**40,078**

7.3.1. Comparison of projects of interest

In their submission Seqwater requested advice on various projects. These projects, their value and the sample projects are included in **Table 48**.

- **Table 48 Seqwater advice requested projects, value and the sample projects**

Project	SKM	Seqwater	2012/13 Cost ($000s)
Molendinar Upgrade	✓	✓	2,000
Mudgeeraba Upgrade	✓	✓	2,000
Beaudesert Upgrade	✓	✓	2,500
Boonah Kalbar WTP upgrade	✓	✓	2,500
Lowood Upgrades including sludge handling improvements	✓	✓	2,000
Flood Damage Repairs	✓	✓	9,848
Gold Coast Desalination Plant Autoflush of SAF Pumps and Headers	✓		1,975
Gold Coast Desalination Plant R&M Asset Replacement	✓		3,812
North Stradbroke Island Upgrades	✓		1,075
Jimna Upgrades	✓		1,661
Kilcoy Upgrade	✓		8,353
Margaret Street Office - Business driven projects from ICT Ops Plan Plant & Equipment	✓		1,700
Maroon Dam Safety Upgrade - stage 1	✓		4,000
Mt Crosby Eastbank WTP - Holts hill chlorine control building Foundation repairs	✓		1,654
Kooralbyn upgrades including sludge handling improvements		✓	1,555
Lake Macdonald Safety upgrade		✓	1,000
Image Flat Upgrade		✓	1,137
Canungra off-stream storage Upgrade		✓	500
Canungra WTP		✓	900
Capalaba Upgrades - Stage 1		✓	3,000
Wyaralong WTP works including design		✓	1,000
Mt Crosby Eastbank WTP centrifuge works and transfer		✓	1,200
Ewan Maddock Dam Safety upgrade		✓	2,000
Kirkleagh WTP Upgrade		✓	900
Landers Shute WTP lime/caustic upgrade		✓	750
Online instrumentation Upgrades		✓	885
SCADA strategy implementation		✓	800
South Maclean WTP upgrades		✓	2,250
North Pine WTP works including the sludge handling upgrade, filter upgrade and chemical dosing relocation		✓	2,555
Total			**65,510**

The sample will review approximately 70% by value of the Seqwater request.

7.4. Water treatment

Seqwater's Water Treatment Plant HACCP Plans are the site specific water quality management systems for water treatment plants, and provide target water quality levels and corrective actions. Seqwaters standards of service require that drinking water meets the ADWG at the consumers tap. To allow for degradation of water quality that occurs in the distribution network, Seqwater's water treatment plants treat drinking water to a higher standard than required by the ADWG. Key treated water quality targets are included in **Table 49**.

- **Table 49 Kalbar treated water quality targets and ADWG**

Parameter	ADWG aesthetic limit	ADWG health limit
Chlorine (free) (mg/L)	N/A	5
E. coli (cfu/100mL)	N/A	Detection
Iron (total) (mg/L)	0.3	N/A
Manganese (total) mg/L)	0.1	0.5
pH	6.5 – 8.5	N/A
Turbidity	5	N/A
Colour	15	N/A

In addition to treated water quality targets, HACCP Plans provide operational targets, action limits and critical limits for water quality at critical control points (CCP) and quality control points (QCP) throughout the water treatment plant. The operational target, action limits and critical limits for a range of Seqwater water treatment plants, as detailed in their HACCP Plans, are compared in **Table 50**.

SKM's experience in design of WTPs for urban water supply throughout Australia confirm that the operational targets adopted by Seqwater are not overly conservative.

The above table illustrates that there are variances between plants for specific parameters, however the values compared across plants are comparable. The process of a hierarchy of limits is typical industry practice, although different terminology is often used. The determination of the operational target, action limit and critical limit are subjectively assessed via a HACCP process.

It is acknowledged that these various steps result in a target limit that is generally between 5 to 10 (1/2 to 1 order or log) times less that the critical limit and the ADWG limit.

It is also acknowledged that achieving better performance at the lower limits can result in increases in infrastructure size, alternate and more complex technology requirements and even the inclusion of additional process train elements or actions. This can result in disproportionally high costs for an apparently minor increase in performance. Consequently it is important to strike the correct balance.

It is also acknowledged that Seqwater is responsible for managing its business to achieve that regulated and required outcomes, and if a non compliance occurs Seqwater will be held responsible.

In summary:

- The hierarchical process is appropriate
- The limits are appropriately site specific and are set via a HACCP process
- Discussion between the Regulators and Seqwater regarding the correct balance between parameter limit and cost are valid
- Seqwater are ultimately responsible for ensuring compliance
- Seqwater are continuing to develop a greater knowledge of the performance of their natural assets (predominantly catchment) and built assets (predominantly water treatment plants). This should be feedback periodically to inform the confirmation or revision of the limits

Based on the above the current limits are not unreasonable.

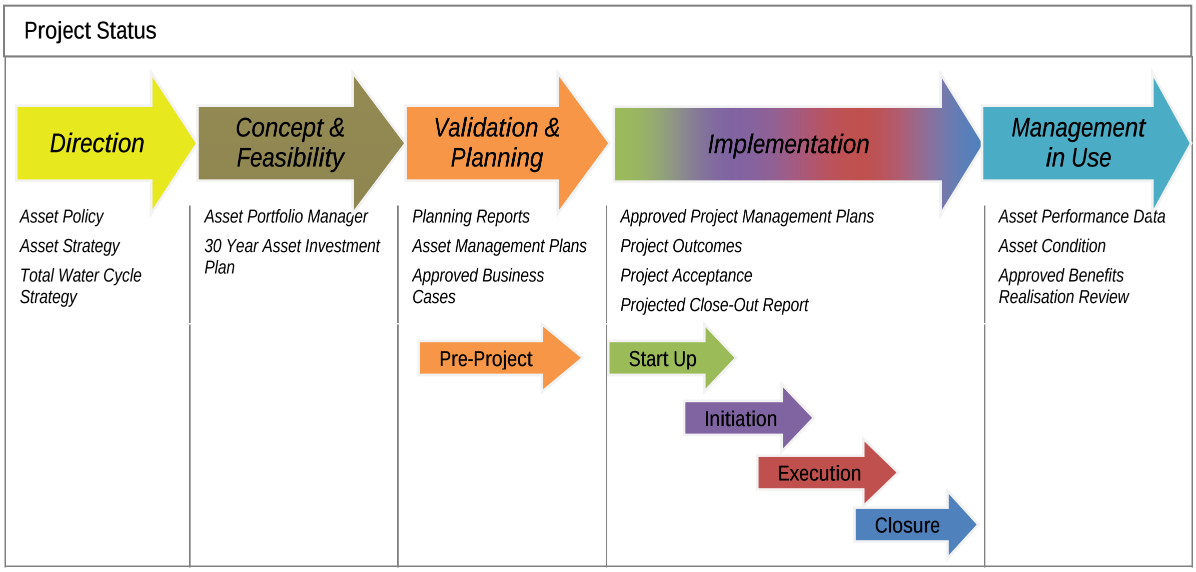
Table 50 Kalbar, Capalaba and Mt Crosby Eastbank WTPs HACCP Plan CCP and QCP water quality targets

Process	Parameter		Kalbar WTP	Capalaba WTP	Mt Crosby Eastbank WTP	ADWG
Capacity						
Raw Water Intake	Raw water Turbidity	Operational Target	<10 NTU online	<10 NTU	<120 NTU	
		Action Limit	>10 NTU for 2 hours online	>20 NTU for 2 hours	>200 NTU for > 10 minutes	
		Critical Limit	>100 NTU for 1 hour online	Nil	>2000 NTU for > 10 minutes	
Coagulation, Flocculation, Clarification	Dosed water pH	Operational Target	6.5 – 6.8	5.7 – 6.1	6.2 – 7.2	
		Action Limit	6.3 – 7.0	<5.6 or >6.1	<6.0 or >7.4 for >10 minutes	
		Critical Limit	6.0 – 7.5	<5.2 or >6.3	<5.8 or >7.5 for >20 minutes	
	Turbidity	Operational Target	<1 NTU	<1 NTU	1.5 NTU	
		Action Limit	>5 NTU	>5 NTU for 4 hours	>3 NTU for >30 minutes	
		Critical Limit	Nil	Nil	>5 NTU for >30 minutes	
	Colour	Operational Target	<5 CPU	<2 HU	<3 HU	
		Action Limit	>10 CPU	>5 HU	>6 HU	
		Critical Limit	Nil	Nil	Nil	
Manganese Removal	Free Chlorine Residual	Operational Target	0.5 mg/L	0.3 – 0.7 mg/L		
		Action Limit	<0.2 - >1.0 mg/L	<0.3 or >0.7 mg/L for 2 hours		
		Critical Limit	>0.1 mg/L	Nil	Nil	
	Treated water Mn	Operational Target	<0.02 mg/L	<0.02 mg/L	0.01 mg/L	
		Action Limit	>0.02 mg/L	>0.02 mg/L	>0.02 mg/L for a single event	
		Critical Limit	>0.10 mg/L	0.02 mg/L for 2 days	>0.02 mg/L for 3 consecutive days, >0.04 mg/L for a single event	0.1 mg/L (A), 0.5 mg/L (H)
Filtration	Turbidity	Operational Target	<0.1 NTU	<0.1 NTU	0.1 NTU	
		Action Limit	>0.2 NTU for 30 minutes	>0.2 NTU for 2 hours	>0.2 NTU for >2 hours	
		Critical Limit	>0.3 NTU for 15 minutes	>0.4 NTU for 30 mintues	>5 NTU for >30 minutes	5 NTU
Fluoridation	Pre-clear	Operational Target	0.7 - 0.9 mg/L	0.7 - 0.9 mg/L	0.8 mg/L at Holts Hill	

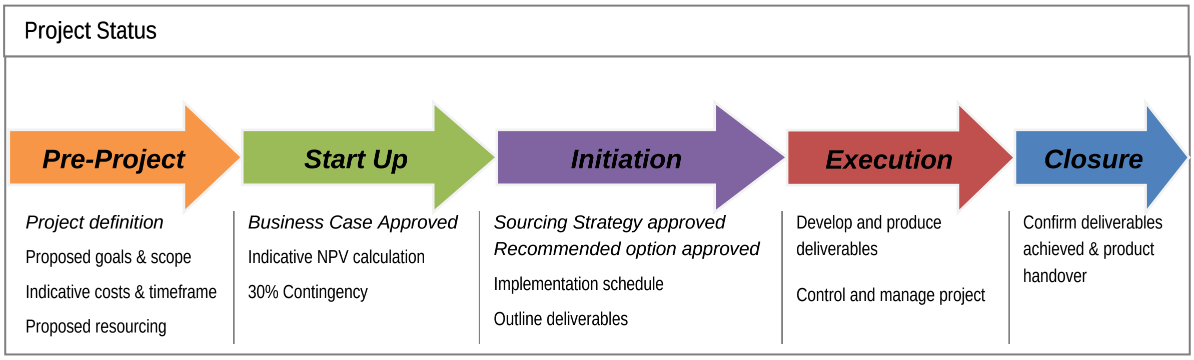
Process	Parameter		Kalbar WTP	Capalaba WTP	Mt Crosby Eastbank WTP	ADWG
	water tank fluoride	Action Limit	0.7 – 0.9 mg/L for 60 minutes	0.7 – 0.9 mg/L for 60 minutes	<0.7 or > 0.9 mg/L for >1 hour	
		Critical Limit	>1.2 mg/L for 15 minutes	>1.2 mg/L for 15 minutes	>1.2 mg/L for >6 minutes, Regulated sample >1.5 mg/L	
	Post clear water tank	Target	0.7 - 0.9 mg/L	0.7 - 0.9 mg/L		
		Action Limit	0.7 – 0.9 mg/L for 60 minutes	0.7 – 0.9 mg/L for 60 minutes		
		Critical Limit	>1.2 mg/L for 2 minutes >1.5 mg/L	>1.2 mg/L for 2 minutes >1.5 mg/L		
Disinfection	Clear water storage chlorine	Operational Target	>2.0 mg/L	1.3 – 1.7 mg/L	2.5 mg/L	
		Action Limit	<1.7 – >3.0 mg/L for 30 minutes	<1.1 or >2.0 mg/L for 2 hours	<1.2 or >3.0 mg/L for >30 minutes	
		Critical Limit	<1.5 – >3.5 mg/L for 15 minutes	<0.9 or >2.5 mg/L for 15 minutes	<0.5 or >4.0 mg/L for >30 minutes	5 mg/L (H)
	Clear water storage pH	Operational Target	7.2	7.2 – 7.3	7.6	
		Action Limit	>7.4	<7.0 or >7.5 for 2 hours	<7.2 or >8.0 for >30 minutes	
		Critical Limit	>7.6	<6.8 or >7.8 for 1 hour	<7.0 or >8.3 for >30 minutes	6.5 to 8.5 (A)
	Reservoir Level	Operational Target	>30%			
		Action Limit				
		Critical Limit				
Treated water	Verification Monitoring	Operational Target	<ADWG	<ADWG		
		Action Limit	NA	NA		
		Critical Limit	Any verification result outside any ADWG limit	Any verification result outside any ADWG limit		

7.5. Project status

The following figure depicts a summarised version of the Seqwater project delivery asset management framework.



- **Figure 13 Overview of Seqwater project delivery framework**



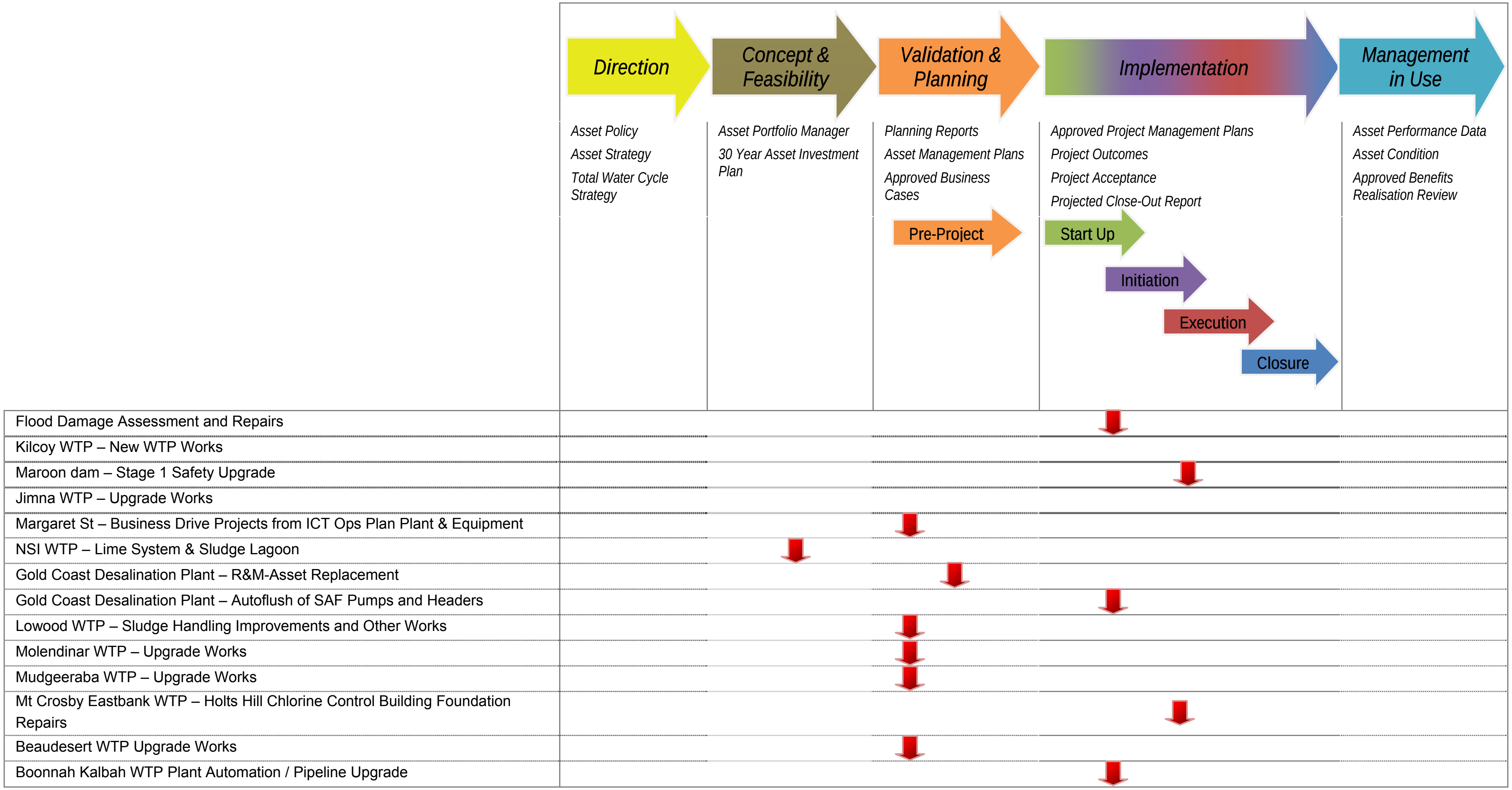
- **Figure 14 Seqwater project delivery framework**

As a project progresses through the phases of project delivery, the detail of the description, costs and program increases, whilst the value of the contingency should decrease. In addition there are various milestones and gateway reviews that it will incur.

The location of the project at the time of the review therefore should respond to a certain level of documentation. To be able to complete a review that is compliant with the Terms of Reference, a project should be at the beginning of the implementation phase, as a minimum.

The status of the sample projects is included as indicated below.

Figure 15 Capital expenditure program status



7.6. Overview of prudency and efficiency

Table 51 shows an overview of the final assessment made for each project of the 2012/13 project sample chosen for assessment of prudency and efficiency. A full summary with recommendations for each project can be found in the following sections of this report.

- **Table 51 Overview of prudency and efficiency of 2012/13 capital expenditure sample selection**

Project	Cost 2012/13 ($000s)	Prudent	Efficient
Flood Damage Assessment and Repairs	9,848	Prudent	Insufficient information to assess all expenditure as efficient
Kilcoy WTP - New WTP Works	14,931	Prudent	Efficient
Maroon Dam - Stage 1 Safety Upgrade	4,000	Prudent	Insufficient information to assess all expenditure as efficient
Jimna WTP - Upgrade Works	1,661	Prudent	Efficient
Margaret St - Business Driven Projects from ICT Ops Plan Plant & Equipment	1,700	Prudent Note: Insufficient information to assess expenditure beyond 2012/13 as prudent	Efficient Note: Insufficient information to assess expenditure beyond 2012/13 as efficient
NSI WTP - Lime System & Sludge Lagoon	1,075	Insufficient information to assess expenditure as prudent	Efficiency not assessed
Gold Coast Desalination Plant - R&M-Asset Replacement	3,812	Prudent	Efficient
Gold Coast Desalination Plant - Autoflush of SAF Pumps and Headers	1,975	Prudent	Partially efficient
Lowood WTP - Sludge Handling Improvements and Other Works	2,000	Prudent	Insufficient information to assess expenditure as efficient
Molendinar WTP - Upgrade Works	2,000	Insufficient information to assess expenditure as prudent	Efficiency not assessed
Mudgeeraba WTP - Upgrade Works	2,000	Insufficient information to assess expenditure as prudent	Efficiency not assessed
Mt Crosby Eastbank WTP - Holts Hill Chlorine Control Building Foundation Repairs	1,654	Prudent	Efficient
Beaudesert WTP Upgrade Works	2,500	Insufficient information to assess expenditure as prudent	Efficiency not assessed
Boonah Kalbar WTP Plant Automation / Pipeline Upgrade	2,500	Prudent	Insufficient information to assess all expenditure as efficient

7.7. Flood Damage Assessment and Repairs

7.7.1. Proposed capital expenditure

Table 52 shows the proposed cost of the Flood Damage Assessment and Remediation Works within the 2011/12 to 2013/14 budgets.

- **Table 52 Flood Damage Assessment and Remediation Works – Proposed capital expenditure profile**

Source	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
A8 2012-2013 GSC Information Return Capex 2012-13.xlsm	6,600	9,848	2,954	-	-	19,402
Dams and Weirs – Overall Seqwater Flood Damage Assessment and Remediation Works Design Summary Report						
Borumba Dam	-	-	-	-	-	1,939
Lake Manchester	-	-	-	-	-	0
Mt Crosby Weir	-	-	-	-	-	3,900
Somerset Dam	-	-	-	-	-	3,357
Wilson Weir	-	-	-	-	-	905
Wivenhoe Dam	-	-	-	-	-	2,749
Total	-	-	-	-	-	**12,850**
Consultancy reports						
Borumba Dam Flood Damage Assessment and Remedial Works	N.P.	N.P.	N.P.	-	-	1,939
Mt Crosby Weir Estimate 2011: Preliminary Design	N.P.	N.P.	N.P.	-	-	3,905
Somerset Dam Flood Damage Assessment Report	N.P.	N.P.	N.P.	-	-	3,356
Wilson Weir Flood Damage Assessment Report	N.P.	N.P.	N.P.	-	-	904
Wivenhoe Dam Flood Damage	N.P.	N.P.	N.P.	-	-	4,779
Lake Manchester	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
Total	-	-	-	-	-	**14,883**

N.P. – Not provided

The reports provided by Seqwater provide detailed breakdowns of the cost estimates for each of the remediation projects. The costs provided in these reports (approximately $ 14,878,000) are significantly lower than those provided in the Return spreadsheet. In addition to this the reports do not specify when the capital expenditure will be spent.

7.7.2. Project description

As a result of the January 2011 flood event, significant damage was sustained by a number of Seqwater dam and weir assets. An inspection of all dam and weir sites was carried out by Seqwater staff after the event to identify damage and confirm the status of dam and weir operation safety. Emergency remediation works were carried out at a number of the sites after these initial inspections, where it was determined necessary to restore dam and weir safety and operations.

Six sites were identified as being of particular concern, and requiring further assessment prior to the commencement of remediation works. These sites were Borumba Dam, Lake Manchester, Mt Crosby Weir, Somerset Dam, Wilson Weir, and Wivenhoe Dam. Concept options for remediation of the identified flood damage were developed and presented to Seqwater internal stakeholders for discussion. An options evaluation was carried out based on set criteria, and preferred concept options were selected and progressed to the preliminary design and costing stage. No capital expenditure is proposed for repair work to the Lake Manchester dam, this is being addressed under the operational works budget and so will not be considered in this review.

The concept options were developed by various consultants. These are identified in below in **Table 53**.

- **Table 53 Flood remediation works – concept design consultants**

Location	Consultant
Borumba Dam	Aurecon
Mt Crosby Weir	SMEC
Somerset Dam	Entura
Wilson Weir	Entura
Wivenhoe Dam	SMEC
Lake Manchester	Seqwater

7.7.3. Provided documentation

The key reference documents used for this review are:

- *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm*, Seqwater, February 2012
- *Dams and Weirs – Overall Seqwater Flood Damage Assessment and Remediation Works Design Summary Report*, Seqwater, no revision number, no date
- Email containing summary of major 2012-13 flood damage assessment and repairs works, Colin Thomson, 21 November 2011
- *Borumba Dam Flood Damage Assessment and Remedial Works*, Rev. 2, Aurecon, November 2011
- *Lake Manchester Flood Damage Assessment*, Rev. 1, Seqwater, November 2011
- *Mt Crosby Weir - Flood Damage Assessment & Remediation Works: Preliminary Design*, Final, SMEC, November 2011
- *Somerset Dam Flood Damage Assessment Report*, Rev. 1, Entura, November 2011
- *Wilson Weir Flood Damage Assessment Report*, Rev. 0, Entura, September 2011
- *Wivenhoe Dam Flood Damage Assessment and Remediation Works*, Final, SMEC, November 2011

7.7.4. Prudency

Cost driver

The nominated cost driver by Seqwater for this project is *renewal*.

Although not specifically mentioned, the cost driver of renewals is supported by the *Dams and Weirs – Overall Seqwater Flood Damage Assessment and Remediation Works Design and Summary Report (Undated)*. Damage sustained by the assets included in this project present a risk of future non compliance of the assets, especially in the event of another significant flood. The nature of the works and the justifications provided support renewals as the relevant cost driver. The following extracts from the aforementioned report highlight the justification of the cost driver of renewals for the following sub-projects:

Borumba Dam: *"It is recommended that Seqwater implement the preliminary design items in order to minimise the risk of further damage and erosion to Seqwater assets, should another major flood event occur, as well as improving general dam safety and operation"*

Somerset Dam: *"The assessment found that the erosion damage on the right hand bank downstream of the dam is not a major risk to the safety and operation of the dam, however, requires remediation in order to provide protection to Seqwater assets and allow for vehicular access to the mini hydro.*

Wilson Weir: *"As a result of the January 2011 flood event the weir suffered extensive erosion damage on the right bank adjacent to and downstream of the weir. The erosion damage on the left bank was significantly less. The current status of the weir is that there is a major risk of further erosion and of the weir being bypassed should another major flood event occur. This would affect supply of water to the Lockyer Valley agricultural region as well as building assets on adjacent land belonging to the University of Queensland."*

All infrastructure being repaired in these projects is currently in use and will remain operational.

Renewal is an appropriate cost driver for this project.

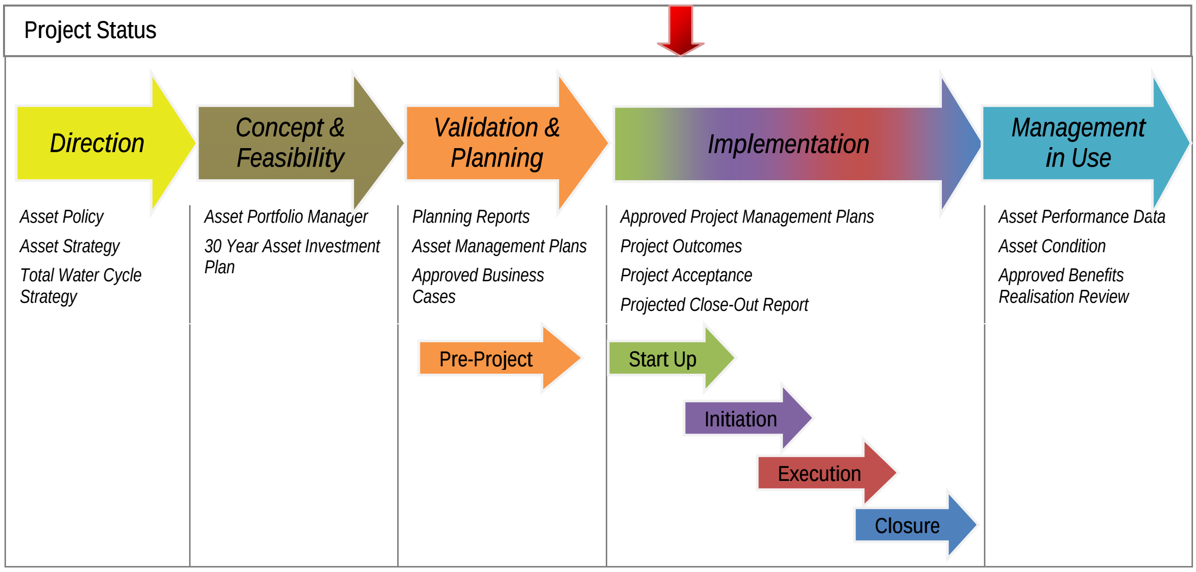
Decision making process

An options assessment was undertaken for each of the sub-projects, and these all included numerous options (ranging from 3 to 13 in number) with each one considering a "Do Nothing" option. Concept design capital cost estimates were provided for each of the options. NPV calculations were not provided as it was not considered that this would have added value to the options analysis as these works are repairs to ensure future compliance, and have minor ongoing capital or operational costs.

The project has been assessed as prudent. The primary driver of renewals has been demonstrated. An appropriate decision making process has been documented.

7.7.5. Efficiency

The estimate of the project status is included below.



The scope of works

The agreed scope of works for each of the sub projects included in the flood damage assessment and remediation works have all been selected after the development of a shortlist of options for each sub project. These shortlists were then assessed based on cost and non-cost criteria and a preferred option was recommended for each sub project. The options assessment process was conducted in consultation with the relevant stakeholders, and a structured and quantitative assessment process was used.

A summary of the type of works by location is included below in **Table 54**.

- **Table 54 Type of works**

	Removal of Debris	Spillway remediation works	Embankment works	Road repair works
Borumba Dam	✓	✓		
Mt Crosby Weir			✓	
Somerset Dam			✓	✓
Wilson Weir			✓	
Wivenhoe Dam	✓	✓		✓

Standards of works

The preliminary designs proposed in the options reports for each of the sub projects refer and conform to a variety of design standards including the DERM safety guidelines, ANCOLD/ICOLD guidelines, USACE standards, as well as various Queensland Main Roads, and Australian standards. It is considered that the design standards of work are appropriate in all the sub projects as they conform to relevant codes and standards.

Project cost

Table 55 to **Table 59** contain details of the capital cost estimates for the projects. Quantities and unit rates were provided for Borumba Dam, Mt Crosby Weir, Somerset Dam, Wilson Weir and Wivenhoe Dam.

- **Table 55 Borumba Dam**

Aspect	Cost ($)
Preliminary and General	636,000
Left abutment	30,500
Zone 3	195,000
Zone 4	29,000
Zone 5	725,500
Sub-Total	**1,616,000**
Contingency @ 20% Sub-Total	323,200
Total	**1,939,200**

- **Table 56 Mt Crosby Weir**

Aspect	Cost ($)
Establishment	100,000
Preparation works	540,000
Embankment works	1,820,000
Direct costs	**2,460,000**
Minor items @ 15% Direct costs	369,000
Prime cost	**2,829,000**
Contingencies @ 25% Prime cost	707,250
Subtotal	**3,536,250**
Management @ 15% Direct costs	369,000
Total	**3,905,250**

- **Table 57 Somerset Dam**

Aspect	Cost ($)
Mobilisation	
Vert. Retaining wall	2,087,600
Rip rap downstream	289,900
Culvert pipe	215,200
Surface stormwater drain	25,200
Security fence	53,600
Armco guardrail	90,000
Handrail along spill way	20,200
Concrete slab	
Hole under access road	40,800
Replacement of concrete slab	24,900
Repair of min hydro	6,500
Project management @ 15%	437,835
Total cost	**3,356,735**

- **Table 58 Wilson Weir**

Aspect	Cost ($)
Mobilisation and demobilisation @ 10%	11,000
RIGHT bank repair inc contingencies @ 20%	695,900
Left bank repair in contingencies @ 20%	79,700
Project management cost @ 15% construction cost	118,000
Total cost	**904,600**

- **Table 59 Wivenhoe Dam**

Aspect	Cost ($)
Repair of sealed roads	710,000
Repair of gully	380,000
Pedestrian access along spillway	480,000
Atkinsons Crossing car park	389,000
Reinstate batters	440,000
Investigations on viewing platform	350,000
Repair of cavitation	
Diving inspection of plunge pool	
SCM modelling of pool	50,000
Monitoring of erosion at d/s end of plunge	
Reduce height of rock mound	1,650,000
Locally grade and rock break to suit fish passage	330,000
Total	**4,779,000**

The method of estimating of each dam repair project varies, as can be seen by comparing **Table 55** to **Table 59**. This is the result of the numerous consultants working on the different projects.

The costing data was reviewed for consistency across the sub-projects. This is documented below in **Table 60**. Unfortunately there is very little comparable activity. Where a comparison is possible the variance of costs is not unreasonable.

- **Table 60 Price comparison**

Activity	Unit	Borumba Dam	Mt Crosby Weir	Somerset Dam	Wilson Weir	Wivenhoe Dam
Mobilisation	Unit	80,000	-	25,000	5,000	-
% of capital estimate		4%	-	1%	1%	-
Demobilisation	Unit	80,000	-	25,000	5,000	-
% of capital estimate		4%	-	1%	1%	-
General survey	Unit	34,800	-	-	-	-
Dilapidation Survey	Unit	15,000	-	-	-	-
Access Track/ road works		**-**	**-**	**-**	**-**	**-**
Excavate and construct wide access track	m^2	-	-	-	30	-

Activity	Unit	Borumba Dam	Mt Crosby Weir	Somerset Dam	Wilson Weir	Wivenhoe Dam
Cement stabilising	m^2	-	-	-	-	35
Road base	m^2	-	-	-	-	35
Spray seal	m^2	-	-	-	-	15
Steel guardrail	m	-	-	276	-	400
Drainage channel	m	-	-	-	-	100
Supply crushed rock	m^3	-	-	79	-	-
Prepare and rehabilitate site		**-**	**-**	**-**	**-**	**-**
Clear alluvium material from around weir wing walls to rock surface and stockpile	m^3	-	-	-	20	-
Strip sloping surface in preparation for Reno mattresses	m^3	-	-	-	30	-
Clean up site on completion	Unit	-	-	2,500	3,000	-
Top soil and grass	m^2	-	-	10	-	15
Gabion baskets		**-**	**-**	**-**	**-**	**-**
Supply and place 25Mpa screed	m^3	-	-	-	350	-
Drill 0.5m deep holes 38mm min dia & supply 1m long cogged dowel bars and grout	Unit	-	-	-	200	-
Drill, supply N36 bars, 7.7m long and grout 6.5m into rock		-	-	1,600	-	-
Supply place and fill gabions (1m * 1m) galvanised and PVC coated	m^2	-	-	-	85.65	-
Supply place and fill gabions (1m * 0.5m) galvanised and PVC coated	m^2	-	-	-	55.45	-
Supply and place Geotextile around gabions	m^2	-	-	-	9.9	-
Earthworks		**-**	**-**	**-**	**-**	**-**
Trim / Shape Batters	m^2	-	-	-	-	20
Place fill (onsite source, place, compact)	m^3	-	-	20	-	30
Supply and place filter	m^3	-	80	-	-	80
Excavate rock	m^3 or LS	122.5	-	150	150	10,000
Excavation in soil	m^3	-	30	70	-	-
Excavation of Debris	m^3	104	-		-	-
Excavation in Bed Rock	m^3	-	-	250	-	-
Reno Mattresses		**-**	**-**	**-**	**-**	**-**
Supply and place Geotextile under mattresses	m^2	9.18	-	10	9.9	-
Supply, place and fill Reno mattresses on gabion steps	m^2	-	-	-	20.55	-
Supply, place and fill Reno mattresses on slope above gabions	m^2	-	-	-	20.55	-
Removal of Reno mattress and damaged walkway	Unit	9,360	-	-	-	-
Backfill Material		**-**	**-**	**-**	**-**	**-**
Supply, place and compact backfill	m^3	-	-	-	21	30

Activity	Unit	Borumba Dam	Mt Crosby Weir	Somerset Dam	Wilson Weir	Wivenhoe Dam
in 500mm layers						
Supply and place uniaxial geogrid	m^2	-	-	-	13.25	-
supply and place sheet drainage layer	m^2	-	-	-	16	-
Supply and place Ag drainage pipe (100mm dia slotted and socked)	m	-	-	15	15	-
Concrete capping		-	-	-	-	-
On upstream side of weir, Remove excess rock to 0.3m below top of training wall	m^3	-	-	-	100	-
Compact rock fill	m^3	-	-	-	100	-
Supply and place concrete 0.3m thick with 2 layers of SL81 reinforcing mesh	m^3	-	-	550	650	-
Concrete placed in difficult location	m^3	-	-	-	-	3000
Reinforced formed concrete placed in dificult location	m^3	-	-	-	-	5000
Reinforced concrete	m^3	-	-	1750	-	-
Anchors/dowels placed in difficult location	Unit	-	-	-	-	800
Concrete lining	m^3	1,221.29	-	-	-	-
Binding concrete - 25MPa	m^3	-	-	500	-	-
Synthetic erosion control matting		-	-	-	-	-
Supply and place 50mm thick topsoil over backfill material	m^3	-	-	-	6	-
Supply, lay and pin erosion control matting	m^2	-	-	-	15	-
Supply and sow grass seeded	m^2	-	-	-	2	-
Supply and brush topsoil into erosion control matting	m^3	-	-	-	2	-
Riprap at downstream end of repair works		-	-	-	-	-
Supply and install Geotextile.	m^2	-	-	-	9.9	
Supply and place rip rap	m^3	83/147	100	25/35	33.3	30
Transition	m^3	-	80	-	-	-
Excavation of rip rap	m^3	54.38	-	-	-	-
boundary fence / access	-	-	-	-	-	-
Supply and erect wooden posts and 4 strand barbed wire.	m	-	-		21	-
Security fence	m	-	-	250	-	230
Supply and install pre fab stairs (1-2 m high)	Unit	-	-	-	-	15,000
Supply and install horizontal lifeline	Unit	-	-	-	-	3,000
Handrail	m	276	-	186	-	-

Seqwater submitted a total of approximately $ 19.4 million for the Flood Damage Assessment and Remediation Works whereas the information provided for the repair of each individual dam or weir equates to a total expenditure of approximately $ 14.8 million, as outlined below in **Table 61**. Information to resolve this difference has not been provided.

- **Table 61 Repair costs by location**

Location	Total cost ($)
Borumba Dam	1,939,200
Mt Crosby Weir	3,905,250
Somerset Dam	3,356,735
Wilson Weir	904,600
Wivenhoe Dam	4,779,000
Lake Manchester	N.P.
TOTAL	**14,884,785**

N.P. – Not provided

Approximately $ 6.6 million has been included in the budget for 2011/12. No information has been provided to resolve this expenditure; however it may be associated with urgent repairs required after the flood.

7.7.6. Policy and procedures

The project appears to be compliant with Seqwater's policies and procedures.

7.7.7. Timing and deliverability

A provisional project program has been included in the business case which shows that the initial condition assessment, preliminary design, and internal approval process will be completed by the end of the 2010/11 Financial year. Detailed design is the middle of the 2011/12 financial year and the procurement process is to be concluded early in the 2012/13 financial year. Construction is set to commence early in the 2012/13 financial year with all projects to be fully commissioned in the second half of that year.

The project program is not described in the business case and is only represented by a Gantt chart in the appendices. The timeframes proposed for the various phases of work appear to be achievable, although it is noted that the current proposed construction period is from September 2012 until March 2013. This period is the annual wet season and significant or sustained rainfall could seriously impede the ability to complete all of the remediation works. It is considered that any rainfall which results in the need for dam releases at any of the sites requiring remediation, during construction will force the project to halt, and could damage partially completed works. Neither this risk, nor any other risks to the project program have been identified in the business case.

It is further noted that the length of the proposed programme means that since the initial damage was sustained during the January 2011 flood event, two additional flood seasons will have passed before construction is completed. Areas in the programme which have been identified as excessively large are the eight months allowed for assessments and preliminary design, the two months allowed for internal approvals, and the five months allowed for procurement.

7.7.8. Efficiency gains

A sourcing strategy has not been provided. There is the potential for including more than one sub-project in a construction contract to encourage economies of scale.

7.7.9. Allocation of overhead costs

The allocation of overheads was inconsistent across the sub-project costs as illustrated below in **Table 62**.

- **Table 62 Allocation of overheads**

	Borumba Dam	Mt Crosby Weir	Somerset Dam	Wilson Weir	Wivenhoe Dam
Minor items	-	15%	-	-	40%
Contingency percentage used	20%	25%	30%	10% to 20%	
Design and management cost%	19%	15%	15%	15%	25%
Contractor overheads	11%	-	20%	-	-
Minor items applied at	-	Total	-	-	Each Task
Contingencies applied at:	Total	Total	Each Task	Each Task	Each Task
Contractor overheads applied at:	P&O	-	Each Task	-	-
Design and management cost applied at:	P&O	Total	Total	Total	Each Task

Seqwater internal overhead costs are clearly included in the estimate provided for the remediation works at Somerset Dam. Project management costs are included in the cost estimate for the project at Wilson's weir, however it is unclear whether these costs are internal Seqwater management costs or project management by the contractor, the latter meaning that overheads have not been included. The projects at Mt Crosby Weir and at Wivenhoe Dam both have an allowance for design and construction management. It is thought that these costs refer to management by the contractor and therefore Seqwater overheads are not included on these projects either. The project at Borumba dam does not appear to have any overheads of project management costs included.

7.7.10. Summary

The project is assessed as prudent. The primary driver of renewals has been demonstrated and an appropriate decision making process has been completed.

The projects scope is assessed as appropriate, the standards of works appear to be consistent with industry practice and the costs appear to be reasonable and should be market tested. Notwithstanding this, the discrepancy in costs between the *A8 2012-2013 GSC Information Return Capex 2012-13* and the overall report must be clarified before an amount can be approved.

Additional review is recommended after the sourcing strategy has been developed.

The value of expenditure not considered to be prudent or efficient is outlined below in **Table 63**.

- **Table 63 Flood Damage Assessment and Remediation Works - revised capital expenditure profile**

Source	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
Flood Damage Assessment and Remediation Works	0	0	0	0	0	0

It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information should include:

- A complete breakdown of the costs associated with the project across the three years to 2013/14

The adequacy of the information provided on this project is outlined below in **Table 64**.

- **Table 64 Adequacy of information provided**

Section of Capex review	Flood Damage Assessment and Repairs		
Project description			
Provided documentation			
Prudency			
Cost driver			
Decision making process			
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

7.8. Kilcoy Water Treatment Plant – New Water Treatment Plant Works

7.8.1. Proposed capital expenditure

Table 65shows the proposed cost of the new Kilcoy Water Treatment Plant works within the 2012/13 budget.

▪ **Table 65 New Kilcoy Water Treatment Plant works – Proposed capital expenditure profile**

Source	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
A8 2012-2013 GSC Information Return Capex 2012-13.xlsm	6,578	8,353	1,217	-	-	16,148
Kilcoy WTP Board Paper – Scope Change 09/06/11	6,578	10,424	250			17,822

As shown in **Table 9**, the project value listed in Seqwater's 2012/13 Regulatory Submission to the Queensland Competition Authority was less than the figure in the June 2011 Board Paper. As the project is currently under construction this is likely to be the result of greater cost certainty however no explanation for the discrepancy has been provided by Seqwater.

7.8.2. Project description

The project was then reviewed by SKM for the Authority's review of grid service charges for 2011/12 when it was found that there was insufficient information to conclude whether pipeline options, as presented by the SEQ Water Grid Manager, had been adequately considered.

This review builds on last year's work, avoiding repetition where possible. Therefore, please refer to the previous two years' reports for a full history of the review if required.

The Kilcoy Water Treatment Plant is in poor condition and major components of the plant are beyond their useful life, such that either a major upgrade or total replacement is required. Increasing water demand in the area will soon exceed the current raw water allocation from Kilcoy Creek. Recent dry periods also highlighted issues with poor raw water quality impacting on the performance and capacity of the plant.

Seqwater has reported a number of recent quality incidents with the existing Kilcoy supply. In November 2011 in particular there were eleven reported action limits, incidents and HACCP alerts, mainly related to high turbidity. Additionally, Seqwater's June 2011 letter to the Authority explained that Seqwater had been forced to ask the Kilcoy abattoir to voluntarily reduce its short term water consumption in order to avoid interruption of the supply to the remainder of the township.

Seqwater has identified this project as necessary to:

- Comply with water quality requirements for potable supplies to areas serviced by the Kilcoy Water Treatment Plant
- Ensure the existing or new plant is capable of providing the required quantity of water

The benefit would be a reliable water supply to the Kilcoy area which would meet regulatory standards.

Several options were examined, with the recommended option being the replacement of the existing plant with a new plant drawing from Lake Somerset, a more reliable water supply. The existing plant would not be required following this replacement.

The project is currently under construction. Seqwater undertook a Design and Construct contract for the water treatment plant design, construction and commissioning. Earthworks and concrete bases for the wash water and sludge thickener tanks have been completed and work is starting on the main building footings. The project was originally scheduled for completion in December 2012 however Seqwater stated that the revised date for Practical Completion is now May 2013.

The existing Wade St and Kilcoy-Somerset Water Treatment Plants will remain operational until Practical Completion is achieved and will then be decommissioned as part of the contract. The scheduling of the works is such that although construction and commissioning will not be complete by summer 2012/13 Seqwater maintains that the new plant will be able to supply water to supplement the existing plants and meet total demand.

7.8.3. Provided documentation

The key reference documents used for this review are:

- *Kilcoy WTP Planning and Concept Design - Road and Bride Upgrade Investigation*, Revision 0, GHD, April 2010.
- *Report for Kilcoy WTP Project – Existing Road Assessment*, Revision 0, GHD, April 2011.
- *Report for Access Road for Kilcoy WTP – Design Report, Revision A, GHD, June 2011.*
- *Kilcoy Creek Water Treatment Plant Access Options – Preliminary Design Hydrology*, Revision 0, Seqwater, August 2011.
- *Kilcoy Water Treatment Plant Board Paper – Scope Change Approval*, Seqwater, 9 June 2011.
- *Kilcoy WTP Upgrade Business Case Review*, Version 10, Draft, Seqwater 24 May 2011.
- *Lime and CO_2 Dosing Scope Change Internal Memo*, Seqwater, 5 September 2011.
- *Kilcoy WTP Needs Analysis*, Version 1.0, Seqwater, December 2010.
- *Kilcoy WTP Access Road Options Evaluation Summary Report*, Revision 1, GHD, November 2011.
- *Raw water pipe scope change approval internal memo*, Seqwater, 5 September 2011.
- *Kilcoy WTP Upgrade Post Market Budget Review*, Version 3, Draft, Seqwater, May 2011.
- *Kilcoy Pipeline Addendum Report update letter*, GHD, 13 May 2011
- *Kilcoy WTP Upgrade Monthly Report*, Revision B, Seqwater, February 2012.
- *Kilcoy WTP Project budget and expenditure summary*, Version 6, Seqwater, January 2012.
- *Response to Somerset Regional Council Decision Notice Approval letter*, GHD, 10 November 2011.
- *Evaluation Report and Recommendation*, Version 11, Seqwater, June 2011.
- *Kilcoy WTP Planning and Concept Design, Addendum – Regional Planning Options for Kilcoy Water Supply*, GHD, July 2010.

- *Kilcoy Pipeline Addendum, Addendum Report Update,* GHD, 13 May 2011.
- *Kilcoy Somerset WTP – Register HACPP Plan Wall Chart*, Seqwater, 12 February 2012.
- *Kilcoy - Somerset WTP Risk Assessment,* Seqwater, 30 June 2011
- *Kilcoy WTP – Existing Pipeline Investigation, Phase A Report,* KBR, 16 September 2011.
- *Kilcoy Water Treatment Plant Upgrade, Evaluation Report and Recommendation,* Seqwater, 1 June 2011.

7.8.4. Prudency

Cost driver

The nominated cost driver by Seqwater for this project is *compliance*. The business case also outlines the driver to be *demand*.

The conclusion that the project is driven by *compliance* is supported by the following:

- The project involves the increase in treated water capacity to allow the SEQ Grid Water Manager to comply with contractual obligations to Queensland Urban Utilities to address water security, quality and reliability issues
- The existing water supply is vulnerable to both peak demand and asset failure, evidenced by two Level 3 emergencies during 2009 resulting in water supply and quality issues
- The existing Kilcoy Water Treatment Plant operated in excess of 20 hours per day for 20 out of 27 days in May 2011.
- Seqwater's risks assessments have identified a number of high risks with the existing treatment process

Given the above information, *compliance* is considered to be the most appropriate driver of this project.

Decision making process

The course of action adopted by Seqwater for addressing the water security, quality and reliability issues was determined via a series of options analyses. The initial options analysis is outlined in the *Kilcoy WTP Upgrade Business Case* (Seqwater, August 2010). This was subsequently updated in the *Kilcoy WTP Upgrade Business Case Review* (Seqwater, May 2011). During the initial business case development three options were considered in detail, including the 'do nothing' option. A fourth option, a connection to the Water Grid via the Elimbah Reservoir near Caboolture, was considered by GHD late in the project as a high level 'what if' study. It is understood that this process was recorded in an addendum to the GHD report.

The options initially considered were:

- Option 1 – Do nothing
- Option 2 – New water treatment plant
- Option 3 – Upgrade of existing water treatment plant

- Option 4 - Connection to the Water Grid via the Elimbah Reservoir

Option 1 was considered to involve an unacceptable amount of risk, due to continued compliance issues and cost implications. The existing site is sometimes unable to provide sufficient water supply to the township, as experienced during 2009, and is expected to have difficulty supplying peak demands now and in the future. As raw water quality, plant condition and output deteriorate, Kilcoy will be increasingly reliant on a standby plant which SKM understands is a temporary installation with high operating expenses. No information on the operating costs of the standby plant has been provided however the NPV of Option 1 was assessed as $ 23.5 million (over a 20 to 25 year period). This high NPV was a result of compliance and cost issues relating to the potential trucking of water from Caboolture as well as the expected requirement to become increasingly reliant on the temporary standby water treatment plant.

It is understood that the standby plant (the Kilcoy – Lake Somerset Water Treatment Plant) was commissioned in 1991 as a measure to supplement the water supply during peak periods and dirty water events. However, the treatment process at the Kilcoy - Somerset Water Treatment Plant was not capable of maintaining sufficient production rates when treating poor quality water. The plant was subsequently decommissioned. Recently, the plant has been modified and re-commissioned as a short term measure to overcome the inadequate supply issues. However, on its own, it cannot provide sufficient water to meet Kilcoy's demand.

Option 3 was considered infeasible due to insufficient land, topographic difficulties and proximity to neighbours. It would also have required installation of a pipeline from Somerset Dam through the township in order to access sufficient raw water.

Option 4 was considered to have a high capital cost and NPV cost compared to building new treatment plants at Woodford and Kilcoy and its impact on the environment was questioned.

Seqwater therefore identified Option 2 (construction of a new water treatment plant) as its preferred course of action as a new plant could be located closer to a reliable water source and this would also alleviate existing site constraints.

In addition to the options analysis, discussions were conducted between Seqwater and the Kilcoy abattoir (operated by the Kilcoy Pastoral Company) which consumes more than 50 per cent of the current plant's nominal capacity. These discussions established the following:

- The Kilcoy abattoir is expecting to increase its production, most likely resulting in an increased demand for water. However, they are instigating water efficiency measures to offset any potential demand increase
- The Kilcoy abattoir management has confirmed that an ongoing requirement for treated water will be required

Consideration of the pipeline option

Based upon updated project costs provided for the Kilcoy Water Treatment Plant, the SEQ Water Grid Manager expressed concerns in 2011 over the comparison between the proposed new Kilcoy Water Treatment Plant and a grid connected pipeline to supply the Kilcoy region.

Seqwater's decision to proceed with Option 2, the construction of a new Kilcoy Water Treatment Plant, was determined via a revised NPV analysis as outlined in the Kilcoy Water Treatment Plant Upgrade Business Case Review (Seqwater, May 2011). This NPV analysis compared the new Kilcoy Water Treatment Plant, incorporating the revised project budget, with other regional grid supply options. NPV analyses were conducted both with the renewal of key infrastructure and without the renewal of key infrastructure considered.

The following five options were analysed by Seqwater:

- Option 1 – Grid supply pipeline to Kilcoy and Woodford
- Option 2 – Kilcoy Water Treatment Plant and grid supply pipeline to Woodford
- Option 3 – Kilcoy Water Treatment Plant and pipeline from Kilcoy to Woodford
- Option 4 – Kilcoy Water Treatment Plant and Woodford Water Treatment Plant
- Option 5 – Kilcoy Water Treatment Plant, Woodford Water Treatment Plant and grid supply pipeline to Woodford to supply Woodford capacity shortfall

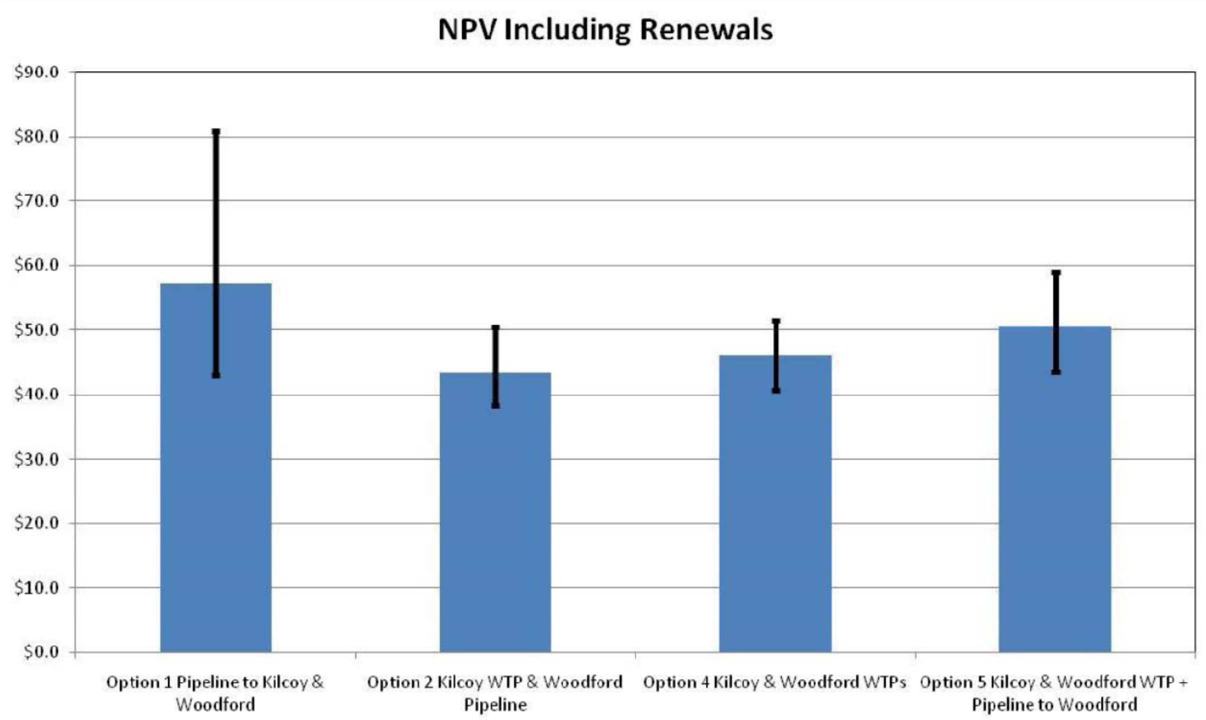
Based on the information provided within the Business Case Review (Seqwater, May 2011), Option 1 consisting of the grid supplied pipelines, presented a higher NPV when compared to Options 2, 4 and 5 for both NPV analyses. Additionally the Business Case Review Report provided by Seqwater highlighted that the grid supply connection option was unlikely to be completed in the required timeframe (by December 2012), exposing Seqwater to the risk of non-compliance.

A full evaluation of Option 3 was not presented within the Business Case Review Report due to it being the most expensive option presented, resulting from the following:

- Larger capacity water treatment plant at Kilcoy required
- Pipeline from Kilcoy to Woodford

As shown in **Figure 16**, below, Option 2, i.e. the scope originally proposed for this project, was found to still be the most cost effective option from the NPV analysis conducted by Seqwater, even using the increased project costs.

Options 4 and 5 presented the second and third best NPVs respectively.



- **Figure 16 Comparison of options by their NPVs (Source: June 2011 Business Case Review)**

It is noted that the cost estimates used to calculate the NPV for the pipeline option were based on a number of assumptions, and that the pipeline option has not been progressed to the same level of design as the water treatment plant options. The cost estimates were based on cost curves, budget quotes for some equipment items, extrapolation of recent similar project pricing and GHD's experience. Although Seqwater states that the "pipeline options have many risks, assumptions and issues which are not accounted for in costs and have potential to result in significant cost increase and programming delay from those estimated for the comparison", it is also possible that the pipeline options have not been adequately developed.

In response to SKM's 2011 GSCs draft report, the SEQ Water Grid Manager raised various concerns with the pipeline options developed. These are summarised below:

- Length of duplication; 18.5 km or 8.5km or 3.5 km depending on detailed investigation
- Diameter of the pipeline; 375 mm or 250 mm, with potential of boosting at Kilcoy for the 250 mm pipeline
- Pipeline material choice DICL vs. PVC, especially on the section between Woodford and Kilcoy
- The NPV comparison did not include, amongst several issues planned renewal and upgrade costs for the Woodford Water Treatment Plant over the next five years
- Kilcoy Water Treatment Plant capital upgrades

In response to these, Seqwater assert that no pipeline option could be implemented and commissioned to meeting the water supply demand timeframe. It is noted that the costs included in the Kilcoy

Pipeline Addendum Report Update that revised NPV costs for pipeline options were higher than in previous reports.

The project has been assessed as prudent. The primary driver of *compliance* has been demonstrated. An appropriate decision making process has been documented.

7.8.5. Efficiency

The scope of works

During the design period several items in addition to the original scope were identified by Seqwater as potentially being required to enable the delivery of the project in line with Seqwater's requirements. These additional items are shown in **Table 66**, below, with the corresponding cost increase.

Table 66 Scope and cost increases

Additional Item	Price ($)
Additional WTP equipment required	600,000
Upgrade to the access road	1,020,000
Lime/CO2 dosing facility	564,000
Raw water and treated water pipeline duplications	512,000
Electricity supply increase	80,000
Increase in the Clear Water Storage volume (CWS)	57,000

The items which have resulted in major cost increases, as summarised in Table 66, above, are discussed as follows.

Additional water treatment plant equipment

As a result of design development and risk assessments conducted during the design period, the requirement for additional equipment for the new Kilcoy Water Treatment Plant was identified in order to deliver the project to Seqwater's requirements. These additional equipment items included:

- Chlorine gas disinfection system
- Thickened sludge balance tank
- Additional centrifuge to provide duty/standby configuration
- Emergency overflow lagoon
- Stormwater overflow lagoon
- Additional UV disinfection unit to provide duty/standby configuration

These additional equipment items were identified as necessary by Seqwater due to the following:

- To ensure compliance with Seqwater Development Guidelines for Water Quality Management in Drinking Water Catchments (2010) in order to obtain Development Approval
- Achieve Seqwater treated water quality requirements

- Provide adequate risk management to meet Seqwater requirements for operations and maintenance
- Essential requirement to construct or operate the new water treatment plant

Upgrade to access road

Two access routes were considered by Seqwater and GHD: a route that crosses the adjacent Kilcoy Creek to Kilcoy in a north direction from the water treatment plant (Option 1), and a second possible route in an easterly direction across nearby ridges to Kennedy’s Road (Option 2). Option 1 involved upgrading the existing gravel access road from Seib St and construction of a bridge across Kilcoy Creek. Option 2 involved upgrading and augmenting the existing gravel access road that winds around the back of the new Kilcoy water treatment plant site from Kennedy’s Road.

Option 2 was selected on cost grounds. Hydrology information dictated that that the level of the bridge for Option 1 had to be raised by approximately 4m to achieve a 1 in 100 year Average Recurrence Interval (ARI). The main impact of this was that quite long approaches to the bridge would have been required because of the low-lying ground that surrounds the bridge site for some distance. To construct the approaches, significant earthworks would have been required and the construction zone would likely have encroached into the township.

The existing gravel road is currently a private access road for property owners. Therefore in the early stages of the design GHD thought that the design would not be required to adhere to any local government design standards. The gravel road would be considered for minimal use only, i.e. existing property owners, the few treatment plant personnel working on site (light service vehicles) and periodic (monthly) chemical deliveries using rigid-body trucks. A cost estimate was prepared on this basis.

However, Seqwater received a letter from Somerset Regional Council stipulating that the design of the road upgrade must be in accordance with the Council’s Development Conditions. This has necessitated design of a higher standard of road than was originally anticipated, specifically, construction of a 3.5 m wide all weather access pavement on a 5.5 m wide formation. Furthermore, investigations showed that rock is present in the area whereas it had previously been assumed that there was none.

The net effect of the changes throughout the design process was that the cost estimate for Option 2 (upgrading and augmenting the existing access road) increased from $ 250,000 in April 2010 to $ 1,020,069 in November 2011. In the same timeframe the cost estimate for Option 1 (bridge across Kilcoy Creek) increased from $ 500,000 to $ 1,564,000.

Seqwater’s February 2012 monthly progress report states that negotiations with Water Treatment Australia and their civil subcontractor have successfully enabled the access road works to be awarded as a variation.

A review of the history of the access road options analysis suggests that Seqwater did attempt to follow an appropriate process, including costed options assessments. However, Seqwater's over-riding priority to progress the project as rapidly as possible to ensure security of supply to Kilcoy is likely to have concluded a decision before all options had been progressed sufficiently. Of the two access options for the new water treatment plant site Seqwater has selected the most economical option, but the cost of this has increased significantly throughout the process.

Potentially, if all the information now available (hydrological data, geotechnical investigation results confirming the presence of rock, the need to comply with the council's Development Conditions, etc) had been available at the time, then Seqwater would have had different inputs in the site selection process for example. However, as with the analysis of the pipeline option versus the new water treatment plant, it can be concluded that an appropriate process was followed and although, with hindsight, it might be possible to show that a different option would have been more economical, Seqwater did make the best choice with the information available at the time and spending more time and money at this point to further analyse the situation would not appear to be of any benefit.

Hydrated lime and carbon dioxide dosing facility

Lime dosing was identified within the business case concept design but not incorporated into the initial business case estimate. Seqwater has now incorporated the hydrated lime and carbon dioxide dosing facility into the project capital expenditure due to advice from tenderers confirming that hydrated lime and carbon dioxide dosing would be required to enable achievement of the process targets.

A potassium permanganate dosing system was included within the original scope for the project however a hydrated lime and carbon dioxide dosing facility would provide an alternative means of manganese removal and therefore alleviate the need for the potassium permanganate. The cost of the potassium permanganate dosing equipment was $ 55,951 so if this is subtracted from the cost of the hydrated lime and carbon dioxide equipment then the net value of the scope change is $ 508,926.

Seqwater have also stated that the hydrated lime and carbon dioxide dosing system would reduce the risk of a health incident associated with high residual aluminium levels which could occur when the alkalinity of the raw water drops. Apparently these conditions often occur shortly after a rainfall event and the existing raw water data and location of the offtake confirm the Kilcoy Water Treatment Plant is susceptible to such an event.

It is further noted that other existing Seqwater water treatment plants adopting similar process technologies have required lime dosing systems to prevent exceedances associated with this issue. An appropriate process design procedure appears to have been followed, including consideration of a number of non-cost criteria and an options evaluation workshop. Hence, it is assumed that the risk of a lime dosing system being ultimately required was considered in this assessment process, given that the potential need for lime dosing was identified within the business case concept design, but not incorporated into the initial business case estimate.

Insufficient information has been provided to determine whether any of the other process technology combinations initially considered would not have been at risk of requiring lime dosing and whether the additional $ 500,000 added to the scope for the lime dosing during tender would have changed the outcome of the original options assessment in any way.

The need to incorporate lime and carbon dioxide dosing into the project is confirmed by the fact that no tenderer would offer compliance with the treated water quality parameters without its inclusion. Therefore, either the treated water quality parameters or process technology selection must be challenged or the scope change must be accepted.

Raw and treated water pipeline duplications

Seqwater has highlighted within the Post Market Budget Review that duplication of the raw water and treated water pipelines may be required as part of the new Kilcoy Water Treatment Plant. The scope change to duplicate the raw water pipeline was internally approved by Seqwater in September 2011.

The consideration of the pipeline duplication was established during further project development which highlighted that the potential high pressures required to transfer required water volumes during commissioning may result in pipeline failure. This would also result in failure to successfully commission the new water treatment plant to the intended design capacity. The inclusion of this duplication of the raw and treated water pipelines in the scope is to mitigate the risk associated with the potential inability to achieve successful commissioning of the new Kilcoy Water Treatment Plant.

Seqwater also identified a number of benefits to pipeline duplication, including reduced operational costs due to improved hydraulic efficiency, cost savings through elimination of separate procurement costs associated with a future project and increased flexibility for future maintenance of one pipeline while the other remains in service. None of these benefits have been quantified by Seqwater.

Standards of works

In addition to the concern over increased costs, the SEQ Water Grid Manager expressed concern regarding the treated water quality targets adopted by Seqwater within the project specification for the Kilcoy Water Treatment Plant. In particular the following was noted as being particularly stringent or overly conservative:

- Turbidity – 0.1 NTU 95th percentile and 0.3 NTU limit
- Achievement of above specification treated water with a raw water turbidity of up to 500 NTU while operating at full capacity (4 ML/d)

In the process of drafting the 2011 report, SKM queried the water treatment limits set by Seqwater. Seqwater stated that:

> *"the treated water quality limits set for the Kilcoy WTP are based on Australian good industry practice and at levels that are typical (and achievable) for modern conventional WTPs. The limits specified are generally more conservative than those specified in the ADWG [Australian Drinking Water Guidelines], this is because the ADWG values apply at the consumer tap and it is likely for*

many of the parameters (e.g. disinfection by-products, manganese, turbidity) the quality of water will degrade within the distribution system. In setting these limits consideration was given to the water quality notification triggers set for treated water entering the Kilcoy distribution system managed by Queensland Urban Utilities (the downstream Distribution Retail Entity). Consideration was also given to the trend in health based targets set in Australian and international guidance/regulation around safe drinking water. They are consistent with the objectives of Seqwater's Water Quality Policy and approved Drinking Water Quality Management Plan."

At a later date, Seqwater stated that following the post market review, the specification for the plant has been relaxed to 0.3 NTU (95th percentile) and 0.5NTU (limit).

In addition, Seqwater provided the information on comparative water treatment plants within the industry. Seqwater has stated that these limits reflect standard industry practice, as evidenced by:

- The specifications set for the Wyaralong Water Treatment Plant, endorsed by the Queensland Water Commission and Department of Infrastructure and Planning, adopted a 95%ile of 0.5 NTU for turbidity

The specifications set for recent water treatment plants constructed in Australia, including those noted below in **Table 67**.

- **Table 67 Comparison of water quality standards at water treatment plants with in-filter DAF treatment process**

Water Treatment Plant	Turbidity 95%ile in NTU	Capacity in ML/d
Distillery Creek	0.1	40
Campbell Town	0.1	2.7
Corryong	0.1	3.1
Myrtleford	0.1	6
Mt Beauty	0.2	2.7

Source: 13/07/11 email from Seqwater to the Authority and SKM

SKM queried the requirement for the plant to treat raw influent up to 500 NTU at peak future capacity. Seqwater has stated that the following items were considered in determining the 500 NTU raw water turbidity parameter:

- *"The location where the Kilcoy WTP draws water from the Somerset Dam is located within a pre existing river. At low water levels the offtake is therefore positioned within a narrow river like section of the dam which is fed by the Stanley River and susceptible to large variances in turbidity*
- *The new Kilcoy WTP will be the only supply of water to Kilcoy and therefore requires a high level of reliability for all raw water quality conditions*
- *There is limited event based water quality information available for this site which is representative of the high turbidity conditions which may exist in at the water source."*

In addition, Seqwater's risk assessment for the water treatment plant rated the hazard presented by turbidity as a high risk. This is based on the following results (taken from Seqwater's Hazard Identification and Unmitigated Risk for the Kilcoy WTP - Somerset offtake):

- Mean turbidity result of 10 NTU, with a range of 0 to 148 NTU over 241 samples
- 99% samples over the ADWG
- Event monitoring shows turbidity peaks up to 524 NTU

SKM agrees that the need to meet ADWG at the consumer tap requires a higher quality of water to be produced at the treatment plant. SKM's experience in design of water treatment plants for urban water supply in Australia confirms that these quality parameters are typical of those specified for Australian good industry practice and at levels that are typical (and achievable) for modern conventional water treatment plants. It is best practice to operate plants optimally at their performance capability to minimise water quality risk to consumers, and these water quality performance requirements are being regularly specified by water authorities as their design requirement. This enables the authority to responsibly set operational targets within a contracted water quality "envelope" and provide some flexibility in plant output and margin for operational adjustment to maintain supply and compliance with variable quality raw water supply.

SKM notes that the relaxed specification for the plant of 0.3 NTU (95th percentile) and 0.5 NTU (limit) is more consistent with current guidelines.

Project cost

The costs provided by Seqwater have been determined through competitive tender and therefore are believed to accurately represent the current market value of the project. This tender process involved five tenderers costing all of the proposed works. Based on the information provided, the base price tenders for the works (which incorporated only the design and construction of the water treatment plant and contract contingency) ranged from $ 10 million to over $ 20 million. The preferred tender selected by Seqwater was the second cheapest, with a base price of $ 11.31 million.

The market response substantially exceeded the approved business case budget estimates, which led Seqwater to conduct a subsequent post market review of the business case, confirming the validity of the project and the requirement for the additional budget for delivery.

Due to the status of the scope and design at the time of tender, Seqwater also reduced price variance risk by obtaining lump sum prices from tenderers for four key project risk items such as the pipeline duplications, lime dosing facility, etc for a pre agreed variation schedule. This approach was required as the need for these items had not been determined at the time of tender and ensured that these items have also been competitively priced by the open market.

Table 68, below, provides a breakdown of the different elements of the project cost and how each relevant element was priced as part of the tender, i.e. fixed price, pre-agreed variation or contract variation/separate contract.

Table 68 Summary of project costs

Description	Amount ($000s)	Allocation	Source
Original contract			
Design and construction of water treatment plant	10,686	WTP D&C contract fixed price	Post Market Budget Review
Clear water storage upgrade to 400kL (from 200kL)	57	WTP D&C contract – pre agreed variation	Post Market Budget Review
Lime/CO_2 dosing facility	564	WTP D&C contract – pre agreed variation	Post Market Budget Review
Subtotal of contract fixed price	**11,308**		
Contract contingency	1,696	15%	Post Market Budget Review
Total of original contract budget	**13,004**		
Additional contract budget			
Raw water pipeline	406	WTP D&C contract – pre agreed variation	Raw Water Pipe Scope Change Approval
Treated water pipeline	106	WTP D&C contract variation or separate contract	Post Market Budget Review
New access road and existing road upgrade	1,020	WTP D&C contract variation or separate contract	Road Options Summary Report
Subtotal of additional contract budget	**1,532**		
Contingency	473	Approx 22% of original figure (30%of final figure)	Post Market Budget Review
Total of additional contract budget	**2,005**		
Total contract budget	**15,009**		
Project delivery			
Preliminaries and tender phase	281		Post Market Budget Review
WTP D&C implementation	1,091		Post Market Budget Review
Project Implementation	668		Post Market Budget Review
Subtotal of project delivery	**2,041**		
Contingency	192	Approx 10%	Post Market Budget Review
Total of project delivery	**2,233**		
Overall total cost	**17,242**		

This overall total cost is greater than the value of $16.15 million from Seqwater's 2012/13 Information Return. Insufficient information has been provided to determine the source of the difference.

7.8.6. Policy and procedures

The project is governed by the Project Control Group which acts as a steering committee for the project and is ultimately responsible for the success of the project. Its purpose is to ensure that the project meets Seqwater's requirements at all levels.

Seqwater decided to deliver the project as an Early Design and Construct (or D&C) type contract. The advantage of this was that all the design phases could be rolled into one contract which reduced the project schedule and allowed for a consistent designer to be involved throughout the project. This allowed for single point accountability and reduced the risk to Seqwater that could have arisen from contract interface issues associated with a design consultant and constructor. It was also possible to phase the construction such that once the design was approved, construction could begin immediately, thus further reducing the project timeframe. Given Seqwater's primary consideration throughout the process has been the ability to meet its grid requirements in Kilcoy by the 2012/13 peak season, selection of the most expedient delivery method is considered appropriate.

The processes followed during the development of the Kilcoy Water Treatment Plant upgrade are considered to be reasonable. A business case, business case review and number of revisions of the business case review have been produced to reflect the changing scope of the project. The outstanding question, and issue which would appear to underlie each of the unresolved questions about the prudency and efficiency of the project, is whether these processes were applied at the right time in the development of the project. Based on timeframes being critical to maintaining supply and advised instances of supply shortfall within the last 12 months the timing of review activities does not appear unreasonable.

7.8.7. Timing and deliverability

Seqwater developed a project management plan outlining how the project will be delivered. The project management plan also outlines the risks to delivery. These potential barriers to project delivery range from contractual disputes through to unavailability of construction materials or equipment. Seqwater conducted a risk assessment to address all the risks associated with these potential barriers.

The target completion date for the project was December 2012 in order to have the required volume and quality of water for the peak summer season of 2012/13. Slippage in the program means that the Practical Completion date is now forecast as May 2012 however the works are being staged such that the new plant will be able to supply water, in conjunction with the Wade St and Somerset-Kilcoy Water Treatment Plants, in time to meet the peak season demand. Seqwater's February 2012 progress report states that works on site are falling significantly behind schedule and the contractor is currently approximately six weeks late. Seqwater is preparing an action plan to address this and keep the project on schedule, including seeking legal advice.

Seqwater's key reason for proceeding with the construction of a new water treatment plant at Kilcoy rather than spending more time analysing the viability of a grid supply pipeline, as instructed by the SEQ Water Grid Manager, was the time constraint. Further development of the pipeline option would have taken additional time and construction of the pipeline option would also have had programme risks, particularly associated with required approvals in a non drought situation.

Postponing the construction of the new Kilcoy Water Treatment Plant would require the continued reliance on the existing plant during the 2012/13 peak summer season. Seqwater has stated that this would be likely to result in departure from HACCP commitments, exposing Seqwater to a risk of non-compliance with the applicable Drinking Water Quality Management Plan (DWQMP) and therefore a breach of the Water Supply (Safety and Reliability) Act 2008 and the Grid Contract.

7.8.8. Efficiency gains

The following potential efficiency gains have been outlined by Seqwater:

- Ability to provide a resilient supply for Kilcoy due to improved operational efficiency and reliability without relying on standby plant
- Increased process efficiency and control due to the following:
  - Operational environment will be fully automated
  - Sufficient design capacity to meet demand until 2031
- Reduction in operating costs due to reducing or negating future reliance on the following
  - Standby plant currently required with high operating expenses
  - Tankering in of water from Somerset Dam

No costs have been provided for these potential efficiency gains.

7.8.9. Allocation of overhead costs

Insufficient information on cost breakdowns has been provided to make a full assessment but it appears that there may be some double counting of contingencies. For example, a contingency of 15% was allowed in the road cost breakdown in the Road Options Summary Report but a contingency of approximately 22% was also allowed on all additional contract budget items in the Post Market Budget Review. There has been an ongoing development of the cost estimates, recorded in a number of separate documents and the information supplied to SKM is insufficient to determine whether the application of contingency is appropriate or excessive.

7.8.10. Summary

The project is assessed as prudent. The primary driver of compliance has been demonstrated and an acceptable decision making process has been documented.

The project is assessed efficient as the scope is appropriate, the standards of works are/are not consistent with industry practice and the costs are consistent with prevailing market conditions.

The value of expenditure not considered to be prudent and efficient is: Nil.

It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information should include:

- Response to the SEQ Water Grid Manager’s concerns raised in the 2011 report
- Documentation demonstrating the need for lime CO_2 dosing to achieve the target water quality from the raw water being sourced

- Needs analysis or business case which covers the raw and treated water pipeline duplications and includes options analyses and cost estimates
- An explanation of the difference in budget (both in size and allocation between financial years) between this year's GSC Information Return and the *Kilcoy WTP Board Paper* dated 09/06/11

The quality of the information provided on this project is outlined below in **Table 64**.

- **Table 69 Quality of information provided**

Section of Capex review	New Kilcoy Water Treatment Plant works	
Project description		
Provided documentation		
Prudency		
Cost driver		
Decision making process		
Efficiency		
Scope of works		
Standards of work		
Project cost		
Policy and procedures		
Timing and deliverability		
Efficiency gains		
Allocation of overhead costs		
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

7.9. Maroon Dam - Stage 1 Safety Upgrade

7.9.1. Proposed capital expenditure

Table 70 shows the proposed cost of the Maroon Dam Stage 1 Safety Upgrade within the 2012/13 budget.

- **Table 70 Maroon Dam Stage 1 Safety Upgrade – Proposed capital expenditure profile**

Source	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
A8 2012-2013 GSC Information Return Capex 2012-13.xlsm	250	4,000	3,000	-	-	7,250
Maroon Dam Project Business Case Flood Upgrade	250	N.P.	N.P.	-	-	7,900

N.P. = Not provided

As can be seen in **Table 70** above, a higher total cost is given in the Maroon Dam Project Business Case than in the Grid Service Charges Information Return Spreadsheets. Furthermore, in the project business case it is stated that "DERM (Department of Resource and Environmental Management) advised that funding of $ 12 million has been made available to Seqwater for the Maroon and Moogerah Dam spillway upgrades during 2011/2012". $ 6 million has been allocated to Seqwater for

Maroon Dam in the form of a grant. It is not apparent how this funding fits into the spending timetable in **Table 70**.

7.9.2. Project description

Maroon Dam is a 47 m high earth and rockfill dam with a storage capacity of 44,320 ML at FSL. The dam is located approximately 64 km southwest of Beaudesert on Burnett Creek, a tributary to Logan River. The construction of Maroon Dam was completed in 1974. The purpose of Maroon Dam is to provide an assured supply of water to the towns of Beaudesert and Rathdowney, to supply water for irrigation in the region, and to mitigate floods.

Prior to transfer of the dam from SunWater to Seqwater, a spillway adequacy assessment for Maroon Dam was undertaken as part of the portfolio risk assessment for the referable dams owned by SunWater. This study determined that the existing dam and spillway does not have the required capacity to pass the Probable Maximum Precipitation Design Flood (PMPDF) without overtopping the dam. This has been reviewed and confirmed by Seqwater and the dam is to be upgraded to comply with the Acceptable Flood Capacity Guidelines issued in February 2007 by the Department of Environment and Resource Management (DERM).

The SunWater Acceptable Flood Capacity (AFC) study, Seqwater review and GHD concept design have confirmed that the most cost effective option to increase the flood capacity of Maroon Dam is to raise the crest of the dam by 1.5 m using a concrete parapet wall. This wall will be constructed to connect into the clay core of the main embankment. Additional works may be required to manage the flows through the spillway for extreme events and to improve the stability of the main embankment; these will be separate projects if required.

7.9.3. Provided documentation

The key reference documents used for this review are:

- *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm*, Seqwater, February 2012
- *Business Case – Large Projects – Maroon Dam Acceptable Flood Capacity Upgrade*, Version 0, Seqwater, June 2011
- *Maroon Dam Spillway Adequacy Assessment G-50007-01-09*, SunWater, April 2005.
- *Acceptable Flood Capacity Concept Design Report for Maroon Dam*, Revision 0, GHD, November 2011
- *Maroon Dam Spillway Option 2 Upgrade Estimate Review Report*, Project Support Pty Ltd, April 2010

7.9.4. Prudency

Cost driver

The cost driver nominated by Seqwater for this project is *compliance*.

The project has been initiated as part of the program of works required to ensure that the Seqwater Dam portfolio complies with the DERM Acceptable Flood Capacity Guidelines (2007).

Seqwater as an owner and operator of referable dams is conditioned by the Department of Environment and Resource Management, Office of the Dam Safety Regulator to comply with the guidelines issued by DERM in Queensland. These include:

- Queensland Dam Safety Management Guidelines (NR&M 2002a)
- Guidelines for Failure Impact Assessment of Water Dams (NR&M 2002b) and the
- Guidelines on Acceptable Flood Capacity for Dams (NR&M 2007)

Give this information, *compliance* is considered to be the most appropriate driver for this project.

Decision making process

SunWater (previous owner of Maroon Dam) identified technical options to upgrade the dam as part of the Acceptable Flood Capacity (AFC) Study undertaken in 2005. Following the formation of Seqwater, a program was instigated to comply with the DERM Guidelines by undertaking a revision of the design hydrology, reviewing and updating the failure impacts assessments for the dams and developing upgrade options for the dam. Further options were identified by Seqwater beyond those considered by SunWater, including:

- Do nothing - risk remains unacceptable with no compliance with the dam safety regulations
- Lower the dam - the storage would need to be emptied completely to satisfy the Acceptable Flood Capacity guidelines
- Decommission the dam - technically difficult with high costs for no benefit
- Upgrade the dam – selected option

Seqwater then considered three technical options to upgrade the dam, assessing the cost and feasibility of each:

- Option A – widen the spillway by 50% and raise the embankment by 0.7 m
- Option B – widen the spillway and modify the control structure
- Option C – raise the dam crest by 1.5 m

The Seqwater Business Case (June 2011) confirmed that the most cost effective option to increase the flood capacity of Maroon Dam involved raising the crest of the dam by 1.5 m using a concrete parapet wall (Option C). Option B, which opted for the widening of the spillway and modification of the control structure was feasible and could satisfy the requisite criteria but had very poor hydraulic efficiency. Additionally, the initial cost estimate for Option A, which involved widening the spillway by 50% and raising the embankment by 0.7 m, was $ 16 million compared to the estimated cost of $ 6.5 million excluding contingencies for Option C. It was found that raising the dam wall by 1.5 m had the best hydraulic efficiency of the three options considered.

Subsequently, GHD were commissioned by Seqwater in 2011 to conduct a review of the SunWater Options Study and prepare a concept design for the project. GHD considered the following options:

- Existing Spillway with embankment raise

- Auxiliary Left Bank Channel spillway using one of the following options with or without main dam raise:
  - Open channel
  - Labyrinth spillway
  - Hydroplus Gates
- Existing Spillway with Hydroplus gates
- Existing Spillway with Labyrinth Spillway

Each of the options listed has either a 1.4 m or 1.5 m high parapet wall as the first stage of a potential two staged approach.

GHD developed spillway rating curves for each option and then estimated costs for each option. The recommendation from the concept design was:

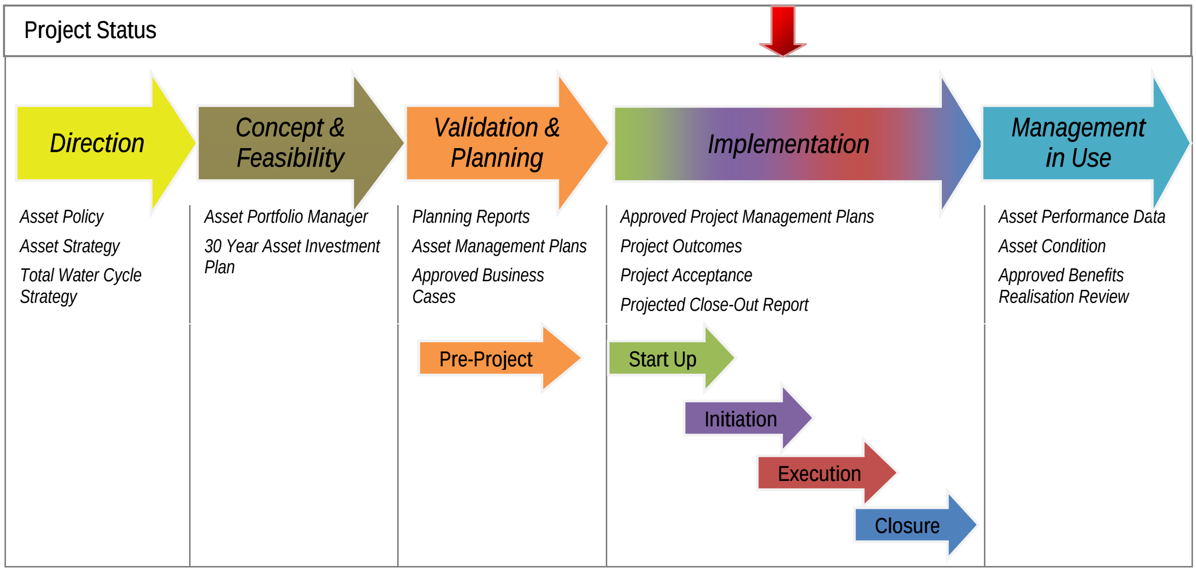
- **Stage 1**
  - Geotechnical investigation works to evaluate the materials within the embankment crest area and the foundation fissured zones to confirm continuity and strengths to be used for any further design upgrade works
  - Parapet Wall design and construction for an additional 1.5 m above the main dam crest level.
- **Stage 2**
  - Re-evaluate the outlet works performance, embankment stability and flood hydrology in order to determine the best approach for another upgrade, which would be the final upgrade possible. Following the outcome of the geotechnical investigations, if it is not necessary to provide additional material at the toe of the embankment to improve the embankment stability, an additional parapet wall raising is appropriate. If rockfill is required to be placed on the downstream berm, the augmentation could widen the spillway and gain the required rockfill. The further investigation of failure risk assessment to evaluate whether the present design meets ALARP requirements and if not, the spillway adequacy could consider a labyrinth or Hydroplus Fusegate option within the main spillway or heightening of the parapet wall

The recommended geotechnical investigation is currently underway as part of the detailed design of Stage 1.

The project is assessed as prudent. An appropriate decision making processes are being used.

7.9.5. Efficiency

The estimate of the project status is included below.



The scope of works

The scope that is included within the estimated budget for Stage 1 includes the detailed design of the works, as well as construction. The project comprises a number of activities, including:

- Excavation earthworks on right bank of spillway and transport of material to dam wall
- Concrete works for control structure and downstream cut-off wall
- Excavation earthworks on crest of dam
- Concrete and reinforcement for parapet wall
- Reinstatement of core material, road pavement, guard rails, etc
- Environmental protection and monitoring
- Improvements to site access to address safety issues
- Improvements to the embankment monitoring
- Engineering design costs and construction support
- Seqwater costs and construction management

This scope appears appropriate for the project.

Standards of works

As part of its 2011 study, GHD developed a RORB hydrological model based on the 2004 SunWater model. Seqwater also developed a hydrological model in 2009 using URBS. The SunWater and Seqwater models resulted in similar peak flood levels for the extreme events, in particular the PMP-DF. All three models resulted in similar peak water levels for the PMP-DF when using the same spillway rating curve. The hydrology data generated by GHD is considered appropriate for the AFC study, however at the time of design it is recommended that both the URBS and RORB model are calibrated and used to evaluate the final spillway option.

No information has been provided on the standard of works to which the project will conform. It is however expected that the works will be required to conform to technical, design and construction legislative and industry requirements.

Project cost

Cost estimates were developed using the unit rates within the SunWater 2005 Spillway Adequacy Assessment which were escalated to current industry rates using a 4% annual escalation over 7 years. SKM calculated the expected budget value to be $ 3.75 million for the 2011/12 financial year. Where possible, Rawlinson's 2011 Australian Construction Handbook was used for comparison. In support of SKM's calculation, a cost estimate for the 2010/11 financial year of $ 3.5 million was considered by Project Support Pty Ltd. Similarly a value of $ 3.8 million can be achieved when scaling the expected project cost to the 2011/12 financial year.

Notwithstanding this, the project business case shows an estimated capital expenditure of $ 7.9 million whilst the Grid Service Charges Information Return Spreadsheet lists a total cost of $ 7.25 million. Both these values are significantly larger than the cost estimate of $ 3.8 million. The reason for the different values in the business case and Grid Service Charges Information Return Spreadsheet is unclear. However, SKM notes that all cost estimates included project management, construction management and design costs, as well as contingency.

Utilising the information available, SKM considers that an allowance of $ 3.8 million inclusive of design costs is acceptable for the Stage 1 upgrade. More information is required detailing why Seqwater has requested at least $ 7.25 million for Stage 1.

7.9.6. Policy and procedures

Seqwater appears to have followed their policies and procedures for the early stages of the project.

7.9.7. Timing and deliverability

GHD is currently engaged by Seqwater to carry out the detailed design for the project. This work includes a geotechnical investigation and drilling and is due to be completed in July or August 2012. According to the program in the business case, Seqwater intended that construction services would be procured in May 2012. This delay to the program could mean that it is not possible to spend the $ 4 million allocated in the Grid Service Charges Information Return Spreadsheet for the 2012/13 financial year. Verbal advice has been received indicating that construction will commence in July 2012 and will have duration of approximately 6-8 months.

Additionally, wet weather during construction has the potential to significantly impact on the construction program given there will need to be restrictions on working when the storage level is above FSL. It is not clear what allowances have been made for construction delays.

Finally, the dam has poor foundation conditions and the geotechnical investigations currently underway will indentify if improvements to the dam foundations are required. If required this work would be a separate within project and may delay this Stage 1 project.

Seqwater has stated that it understands that there is no time limit for the DERM grant and as such the money allocated for 2011/12 would still be available when work starts.

7.9.8. Efficiency gains

There is a proposed upgrade of Moogerah Dam currently under investigation. Given the relatively close proximity of the Maroon and Moogerah Dams, there may be opportunities to combine the two projects to achieve better cost outcomes. This is unlikely however as the Moogerah Dam upgrade works are currently in the initiation phase, so combination of the two projects is unlikely to be feasible due to the programming. Furthermore, the two projects are on a very different scale and required different types of dam works.

7.9.9. Allocation of overhead costs

No information has been provided by Seqwater in relation to allocation of overheads to this project.

7.9.10. Summary

The project is assessed as prudent. The primary cost driver of *compliance* has been demonstrated. Assessment of the efficiency of the project is difficult as the costs are inconsistent.

The value of expenditure considered to be efficient is outlined below in **Table 71**.

- **Table 71 Project Maroon Dam Stage 1 Safety Upgrade - revised capital expenditure profile**

Project	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
Maroon Dam Stage 1 Safety Upgrade	250	3,800	-	-	-	4,050

It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information should include:

- Confirmation of the scope of the project that is being implemented in Stage 1
- Justification of the budget allowance of $ 4 million and $ 3 million in 2012/13 and 2013/14 respectively to implement Stage 1, when compared to the other estimates, which indicate a substantially lower amount
- Explanation of why the project business case and the grid service charges information return spreadsheet show capital expenditure which differ of $ 7.9 million and $ 7.25 million respectively

The adequacy of the information provided on this project is outlined below in **Table 72**.

- **Table 72 Adequacy of information provided**

Section of Capex review	Maroon Dam Stage 1 Safety Upgrade
Project description	
Provided documentation	
Prudency	

Section of Capex review	Maroon Dam Stage 1 Safety Upgrade		
Cost driver			
Decision making process			
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

7.10. Jimna Water Treatment Plant - Upgrade Works

7.10.1. Proposed capital expenditure

Table 73 shows the proposed cost of the Jimna Water Treatment Plant upgrade works within the 2012/13 budget.

- **Table 73 Jimna Water Treatment Plant upgrade works – proposed capital expenditure profile**

Source	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
A8 2012-2013 GSC Information Return Capex 2012-13.xlsm	250	1,661	-	-	-	1,911
Business Case Jimna WTP Upgrade	250	1,661	-	-	-	1,911

The cost estimates and their timing are consistent between the business case prepared by Seqwater and Seqwater's information submission to the Authority.

7.10.2. Project description

Seqwater intends to upgrade and replace elements of the existing Jimna Water Treatment Plant and raw water supply. When taken over from the Somerset Regional Council in 2008, the Jimna Water Treatment Plant was in a relatively poor condition. Seqwater undertook temporary work to ensure that *"the water treatment plant now generally delivers good quality treated water"* [quote from *Jimna WTP Consultancy Brief*]. Although the plant and the process is currently adequate, Seqwater wishes to improve the 'robustness' of the plant, so that it aligns with other plants that Seqwater owns and operates. Seqwater considers the work carried out on the plant to date as temporary fixes that need to be made permanent.

There are 44 residential connections plus one connection for Forestry (the town uses 9 ML per year and Forestry uses 4.2 ML per year). Approximately, half of the connections are for permanent residences and half for holiday homes. Hence although the base population is only 120, the number of residents swells during public holidays and school holidays to 500 or so as there are usually multiple families in each house. There is also a campground with a connection.

The demand on the water treatment plant consequently increases significantly during holiday periods from between 30 and 40 kL/d to around 100 kL/d. In periods of typical demand the plant is operated for a few hours as needed every day or second day to top up the town reservoir. The current capacity of the plant is approximately 260 kL/d over 24 hours which is seen as sufficient to cope with growth that may occur over the forthcoming 20 years.

Work is required to address a number of deficiencies and improve the automation of the plant. The automation of the plant would allow the Seqwater operators to monitor the running of the Jimna Water Treatment Plant from Kilcoy Water Treatment Plant and allow for automatic start ups and faster alert and response times for issues.

The project scope consists of:

- Acquiring the land upon which the Jimna Water Treatment Plant is located
- New raw water pump, pontoon and delivery pipeline
- Clarifier upgrade to include automated desludging and a new cover with a larger access height
- New filter with automated backwashing including duty/standby treated water/backwash pumps
- New sludge handling system
- New facilities for chemical delivery (including site access road), handling and dosing
- Upgrading the electrical and control system and instrumentation

7.10.3. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm*, Seqwater, February 2012
- *Jimna WTP Consultancy Brief: Detailed Design Development of Upgrade Works - Issue for Tender*, Seqwater, 30 January 2012
- *Jimna WTP Upgrade Business Case*, Version 0, Seqwater, July 2011
- *Jimna WTP Planning Report*, Version 6, Final, Seqwater, October 2009
- *Sludge Management Plan Strategy Report*, Revision 1, Final, Hunter Water Australia Pty Ltd, September 2011

7.10.4. Prudency

Cost driver

The cost driver nominated by Seqwater for this project is *compliance*.

Based on the information provided, it would appear that there are in fact several different cost drivers, not just compliance:

- Purchase of the site (the permit to occupy expires in 2016) is driven by renewal
- The intake pump system contains two pumps. It is understood that in the 2011 floods one of the raw water pumps became stuck and is jammed underwater. This pump is considered unusable and needs to be decommissioned. The other pump was recently installed and is pontoon-mounted and suspended about two metres below the surface of the water; however it was ineffective during the floods as its cable stay was caught in overgrown vegetation when the pontoon was submerged. Improvements to the mounting system are required to increase reliability, so this is a service driver
- The raw water main is 80 mm diameter white uPVC (class unknown) and was installed 12 to 15 years ago and, based on assessment by staff of Somerset Regional Shire Council, was generally in a relatively good condition. However, anecdotal evidence suggests that the cover over the main is less than 300 mm in some areas which is insufficient for possible activity above the pipe, such as forestry operations and bushfires. Also, as the pressure recorded at the pumps is higher than that expected based on the difference in elevation and dynamic losses, it is possible that there are restrictions in the pipeline due to localised damage. A new raw water pipeline is required due to risk of flow failure associated with the existing pipeline. This would be a service cost driver
- Listed improvements to the clarifier are an automated desludging valve and a new, higher cover to provide shading and prevent entry of falling leaves while still providing access (the existing cover is a temporary arrangement). Desludging of the clarifier is currently performed with a manual valve. These improvements would also appear to be attributable to a service driver as the current system is functional
- A new filter cell is required to replace the existing unit, which is expected to have a limited life and needs to be washed manually. The appropriate driver for this is renewal.
- The existing treated water pump is used for backwashing the existing filter. An additional unit of similar capacity, operating as duty/standby, is required to provide redundancy in the delivery of treated water and therefore a reliable water supply. Compliance would be an appropriate driver.
- Seqwater have assessed that the sludge lagoons are impervious in which case there could be supernatant discharges to the environment. Furthermore, the lagoons can overflow to the nearby low lying area which flows into a nearby creek. Resolving this is a compliance issue
- At the water treatment plant site, the chemical storage room and delivery area need to be designed to the Australian Standards with bunding sized to 110% of the capacity of the chemical solutions stored. Also, the plant does not have a bathroom or separate safety shower, both of which are needed for the safety and comfort of the Seqwater operators. These are compliance issues
- The scope of works for the ECI detailed design includes the upgrade of the main control and distribution switchboard, associated electrical works and a new SCADA system for the entire Jimna Water Treatment Plant. This would have an improvement driver as it would reduce the amount of operator time required and the degree of water quality monitoring

Decision making process

Seqwater initially identified eight preliminary options. Five of these options were eliminated through an initial feasibility assessment, as summarised in **Table 74** below.

- **Table 74 Initial feasibility assessment**

Option	Viable	Meets needs	Cost effective	Timely
Do not supply water	No	No	-	-
Do nothing	No	No	-	-
Defer any action	No	No	No	No
Catchment management for source water quality	-	No	-	No
Tanker water	-	No	No	-
Supply all water via a pipeline from Kilcoy	Yes	Yes	Yes	Yes
Upgrade the WTP	Yes	Yes	Yes	Yes
Provide a new WTP	Yes	Yes	Yes	Yes

'-' indicates that no assessment was recorded by Seqwater

Following this initial assessment, the three remaining options were considered in more detail:

- **Pipeline from Kilcoy**

  Jimna is located approximately 45 km from and 450 m above Jimna. The capital cost of a pumping station and pipeline was estimated to be in the region of $ 7.5 million. NPV analysis and analysis of pumping and operational costs was not undertaken. The assumptions, parameters, etc, used to arrive at this figure of $ 7.5 million are not known

- **Upgrade the existing water treatment plant**

  External cost estimators developed an estimate of $1.911 million with an NPV of $ 2.86 million for upgrading the plant in accordance with the scope outlined in Section 7.10.5 below. The NPV analysis used a discount rate of 7% and assumed a plant life of 25 years. Operation and maintenance costs of $ 84,850 per year were allowed

- **Provide a new water treatment plant**

  Based on pricing for a similar plant in 2009, the capital estimate for a new plant was $ 3.2 million with an NPV of $ 3.9 million. This does not include the demolition of the existing plant nor the cost of tankering in water should the new plant have to be built on the site of the existing plant

On the basis of this analysis Seqwater chose to upgrade the existing water treatment plant as this option has the lowest estimated capital and present value life cycle cost. Note that insufficient information has been provided to ascertain whether the cost estimate for the pipeline option was adequately developed to give an accurate comparison with the treatment plant options. The specifics of the assessment have not been provided and consequently we are not able to confirm the comprehensiveness of the assessment and equivalence of design and standards of service.

As part of the water treatment plant upgrade options analysis, different treatment processes were analysed for performance, operability, cost and space requirements. Technology options considered included:

- Conventional treatment consisting of:
  - Aeration to precipitate iron, manganese
  - Rapid mixer
  - Mechanical flocculation tank
  - Clarification
  - Media filtration
- Membrane treatment consisting of:
  - Aeration to precipitate iron, manganese
  - Rapid mixer
  - Membrane filtration

Several equipment suppliers were requested to provide budget prices for replacement package systems based on the likely water quality condition. Offers included membrane and media filtration based technologies. Costs ranged from $ 250,000 to $ 500,000 with various inclusions, exclusions and levels of instrumentation. These offers did not include other works such as chemical systems, civil works, upgrading the clear water reservoir, SCADA and raw water pump reliability improvements.

Membrane plants require a certain size to gain economies of scale for them to be cost competitive compared to conventional plant and the costs for membrane filtration for such a small plant are prohibitive compared to a conventional plant. It was also considered that introducing a new technology in a remote location like Jimna would not be appropriate. Further, the extra treatment benefits that membranes would provide are of no benefit due to the log 3 reduction target required for Jimna (membranes would provide 4 log reduction).

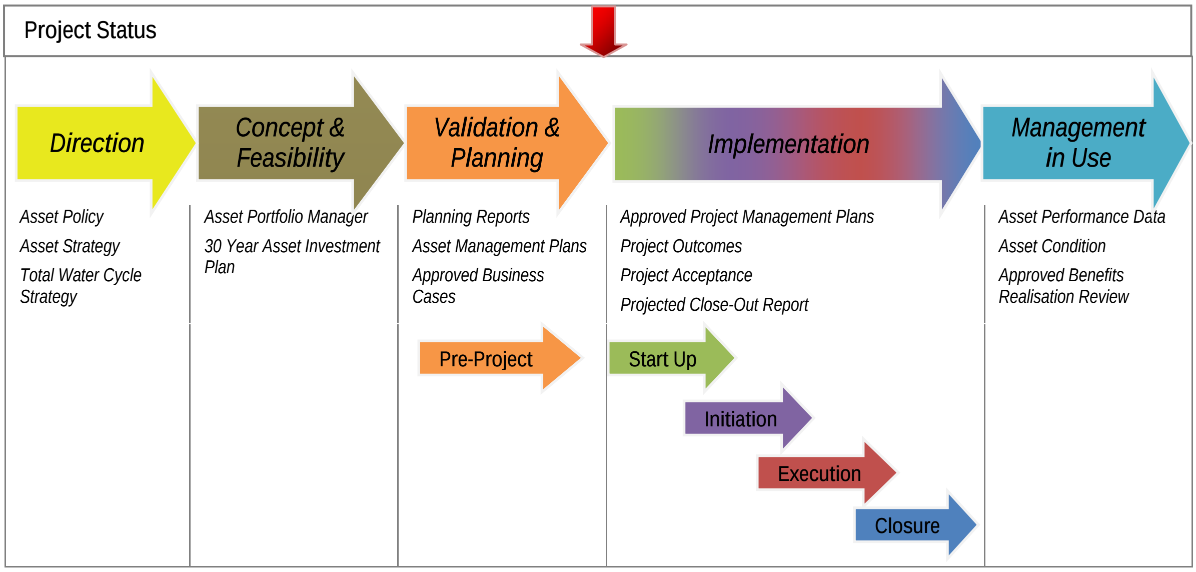
Therefore Seqwater concluded that:

- Membrane based technologies are not appropriate for the Jimna plant
- Conventional media filtration technology with upstream coagulation and clarification be adopted
- If raw water quality deteriorates in the future, a UV system could be installed to provide additional log reduction of pathogens if required

The project has been assessed as prudent. The primary driver of compliance has been demonstrated, primarily based on their works being the conclusion of temporary works, for which compliance was the primary driver, along with a number of supporting drivers. An appropriate decision making process has been documented although additional information should be provided.

7.10.5. Efficiency

The estimate of the project status is included below.



The scope of works

The project scope comprises:

- Acquire the land upon which the Jimna Water Treatment Plant is located.
- New raw water pump, pontoon and delivery pipeline (725 m)
- Clarifier upgrade to include automated desludging and a new cover with a larger access height
- New gravity filter with automated air scouring and backwashing including duty/standby treated water/backwash pumps
- New sludge handling system to thicken sludge, return supernatant to the head of the works and dispose of thickened sludge to a waste disposal site
- New facilities for chemical delivery, handling and dosing (including site access road and small building)
- Upgrade the electrical, control, instrumentation, communications and computer systems for plant monitoring and control, including control of the raw water pumps and pumped supply to the town reservoir

The need for most of these items is clear from the condition of the treatment plant. However, it is not clear that an options analysis or cost comparison has been used to ensure particular elements of the selected scope of work are the best means of achieving the desired outcomes.

Specifically, it is not clear if Seqwater has considered off-site sludge handling or disposal as an alternative to a new sludge handling system. There are four on site options listed in consultants brief but no ‘do nothing’ option.

From the 2009 Planning Report sludge volumes are only about 20 m^3 per week during peak flows and 20 m^3 per three weeks the remainder of the time. Currently there are two on site sludge lagoons/drying beds which are 3 m x 2 m x 1 m deep. Sludge is dried in the beds via solar drying and then disposed of offsite every three to four months (trucked to Kilcoy sludge lagoons).

Sludge lagoon refurbishment consisting of lining the lagoons and installing overflow and decant facilities was estimated to cost $ 78,467 in Hunter Water's Sludge Management Plan ($ 227,018 twenty year NPV).

Similarly, it is unclear whether an automatic desludging valve for the clarifier can be financially justified given its frequency of use. Seqwater has been asked to provide justification of the proposed level of automation throughout the plant in terms of operational savings.

The consultant's brief for the detailed design of the upgrade works has only recently been released so it is anticipated that these issues can be addressed through the design process and result in an appropriate scope of works.

Standards of works

Seqwater aims to operate its water treatment plants to achieve levels that are superior to the Australian Drinking Water Guidelines (ADWG), particularly for turbidity. ADWG values apply at the consumer tap and it is likely for many of the parameters (eg disinfection by-products, manganese, turbidity) the quality of water will degrade within the distribution system. Ongoing site-based risk assessments are currently been carried out by Seqwater and are aiming to identify specific water quality targets at each water treatment plant.

Other draft water quality targets have been produced, for example the SEQ Water Grid Water Quality Management Plan draft, October 2008.

In addition, a treatment specification has been developed for protozoa, viruses and chlorine Ct (concentration x time). This specification was developed to ensure pathogens are effectively managed, as many cannot be monitored successfully at end-of-pipe.

From the consultant's brief, the required filtered water turbidity is < 0.1 NTU as a 95 percentile value. This is the same value as was originally proposed at Kilcoy Water Treatment Plant before its specification was relaxed to a value of 0.3 NTU as a 95 percentile. It is suggested that perhaps the Jimna Water Treatment Plant parameters could be similarly relaxed. In addition, it is recommended that the process design for the plant is reviewed following any relaxing of the specification to determine whether there are any resulting changes to the process design.

Fluoridation of the water is not required under the Water Fluoridation Act 2008 for a small water treatment plant supplying fewer than 1000 people and will therefore not be undertaken.

Project cost

It is understood that the costs shown in **Table 75** were developed by an external cost estimating firm and verified by both Seqwater and external resources, although details of this have not been provided.

- **Table 75 Cost breakdown (base estimate for June 2011)**

Cost component	Base cost ($)	Contingency (%)	Contingency ($)	Total ($)
P&G and temporary works	89,100	30	26,700	115,800

Cost component	Base cost ($)	Contingency (%)	Contingency ($)	Total ($)
Raw water PS	110,400	25	27,600	138,000
Raw water supply pipeline	115,800	20	23,200	139,000
Upgrade to WTP	767,600	25	191,900	959,000
Escalation allowance to completion	101,400	-	-	101,470
Subtotal (construction)	**1,184,300**		**269,400**	**1,453,700**
Design and tender documentation inc support during procurement, construction and commissioning	160,000	30	48,000	208,000
Seqwater's project costs, inc time-related costs with land acquisition and transfer of reservoir	191,500	30	57,500	249,000
Total project estimate	**1,535,800**		**374,900**	**1,910,700**

The escalation allowance to completion of $101,400 or 9.4% of the total construction cost is regarded as high given the base estimate is dated June 2011 and Seqwater anticipates a construction period from August 2012 to June 2013.

The project could be considered to have a disproportionately high cost of treatment per capita given the proposed expenditure and small number of permanent customers. This issue was discussed with the Seqwater project team. Seqwater advised that it assesses that it does have an obligation to supply water to recreational users as its grid contract is simply to supply the area, regardless of the status of the connection.

7.10.6. Policy and procedures

As per Seqwater's procurement procedure, items of capital expenditure with a nominal contract value greater than $ 100,000 require a tender process. As the Jimna Water Treatment Plant upgrade has an expected capital expenditure of $ 1.5 million it should be subject to this method of procurement. The decision on whether the tender will be an open or closed tender must be reviewed and approved by an Executive General Manager.

The project follows Seqwater's standard procedures, including the production of a project business case.

7.10.7. Timing and deliverability

Seqwater has considered the advantages and disadvantages of various procurement and delivery methods and concluded that the project should be undertaken as detailed design and then construction for the following reasons:

- Seqwater's specific scope and preferred equipment can be more readily incorporated
- There is little scope for the innovation that design and construction contracts can deliver as Seqwater has very specific requirements
- Seqwater views that the opportunity to maximise its input and knowledge through the design stage is a key advantage

- The upgraded plant will be a combination of existing and new equipment and under a design and construct contract, design liability would hence be unclear due to the performance of components being interrelated

Seqwater intends that construction commences in August 2012, on the proviso that all land acquisitions and ownership transfers would have been completed, or binding agreements reached. Practical completion would then be attained in June 2013.

7.10.8. Efficiency gains

Based on the NPV analysis appended to the business case there are no anticipated operations and maintenance cost savings resulting from the upgrade works in a normal year. Refer to **Table 76** for details. There is a saving in the 'deferral costs' but an explanation of this is not provided.

- **Table 76 Comparison of O&M costs provided in business case**

Option	O&M cost for normal year ($)	O&M + average deferral cost ($)
Do nothing	82,300	92,500
New water treatment plant	75,600	76,850
Upgrade existing water treatment plant	83,600	84,850

A significant cost saving would have been anticipated to justify the level of automation and the expenditure to facilitate remote operation of the plant from Kilcoy. However, the spending on control systems also has quality benefits and these have not been quantified.

In its 2008 Condition Assessment of Bulk Water Assets report Cardno recommended that Seqwater install a new package plant rather than upgrading the existing plant. The cost estimates at the time indicated that the cost of a new plant was not significantly greater than the cost of the individual replacements and Seqwater would obtain the benefit of a purpose built new asset. However, despite the operational savings predicted to result from a new plant, as highlighted in **Table 76**, the latest cost estimate in the business case gives an NPV of $ 3.9 million for a new plant as compared to $ 2.9 million to upgrade the existing plant.

Seqwater was asked whether any cost/benefit or options analysis had focussed on whether the upgraded plant would be run intermittently at a high rate or continuously at a low rate during periods of base load demand only. No analysis has been provided but Seqwater stated that the upgraded plant will have a turn down ratio of 10:1. It is expected that this would lead to efficiencies compared to the existing plant which is operated for a few hours as needed every day or second day to top up the town reservoir.

7.10.9. Allocation of overhead costs

The capital cost is estimated at $ 1.911 million, including $ 208,000 of design costs and $ 249,000 of project management costs, which account for 11% and 13% of the capital cost respectively.

Contingencies of 20%, 25% and 30% have been used in the preparation of the cost estimate. Overall this results in an average contingency of 26%. This is at the upper end of a reasonable range for this stage of the project.

7.10.10. Summary

The project is assessed as prudent. The primary driver of compliance has been demonstrated and an appropriate decision making process has been documented.

The project is assessed efficient as the scope is appropriate, the standards of works should be consistent with industry practice and the costs will be consistent with prevailing market conditions.

The value of expenditure considered not to be prudent and efficient: Nil.

To provide a complete audit trail, and thereby be prepared for an ex-post review, the following information should be provided:

- Specifics of feasibility / options assessment
- Any option studies, including any assessment of the ‘do nothing’ option to justify the level of automation selected for the plant
- Cost details of operational efficiencies, such as from the turn down ration which will enable the new plant to be operated continuously at a low rate during periods of base load demand
- Options analysis or cost comparison used to ensure particular elements of the selected scope of work are the best means of achieving the desired outcomes
- Evidence that off-site sludge handling or disposal has been considered as an alternative to a new sludge handling system
- Confirmation of process design limits, in particularly turbidity
- Justification of escalation rate

The adequacy of the information provided on this project is outlined below in **Table 77**.

Table 77 Adequacy of information provided

Section of Capex review	Jimna Water Treatment Plant Upgrade Works
Project description	
Provided documentation	
Prudency	
Cost driver	
Decision making process	
Efficiency	
Scope of works	
Standards of work	
Project cost	
Policy and procedures	
Timing and deliverability	

Section of Capex review	Jimna Water Treatment Plant Upgrade Works		
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

7.11. Business Driven Projects from ICT Ops Plan Plant and Equipment

7.11.1. Proposed capital expenditure

Table 78 shows the proposed cost of the Business Driven Projects from ICT Ops Plan Plant and Equipment within the 2011/12 to 2016/17 budgets.

- **Table 78 Lowood Business Driven Projects from ICT Ops Plan Plant and Equipment – Proposed capital expenditure profile**

Source	Costs ($000s)				
	2012/13	2013/14	2014/15	Subsequent	Total
A8 2012-2013 GSC Information Return Capex 2012-13.xlsm	1,700	4,905	4,415	6,754	17,774
ICT 2012/2013 Capex Budget	1,700	N.P.	N.P.	N.P.	1,700

N.P. = Not provided

The information provided in the *ICT 2012/2013 Capex Budget* (Seqwater, March 2012) is consistent with the costs within Seqwater's submission to the Authority for 2012/13. This review has focused on the 2012/13 budget only.

7.11.2. Project description

The Business Driven Projects from ICT Ops Plan Plant and Equipment is a program of seven individual projects. These are:

- Website Redevelopment Project
- Facilities and Property Management
- Water Quality Management System
- Citrix Review Architecture Strategy
- Enterprise Compliance and Risk Management
- Seismic Network consolidation
- Water Billing and Trading Solution

A summary report for the program and project specific reports have been provided. The subject matter of each project is based on the title. The proposed expenditure for each of the projects is outlined below in **Table 79**.

Table 79 Proposed expenditure

Project	Cost 2012/13 ($)
Website Redevelopment Project	100,000
Facilities and Property Management	100,000
Water Quality Management System	300,000
Citrix Review Architecture Strategy	500,000
Enterprise Compliance and Risk Management	400,000
Seismic Network consolidation	150,000
Water Billing and Trading Solution	150,000
TOTAL	**1,700,000**

7.11.3. Provided documentation

The key reference documents used for this review are:

- *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm*, Seqwater, February 2012
- *ICT 2012/2013 Capex Budget*, Seqwater, March 2012
- *Website Development Project - Project Brief (pre-market Business Case)*, Seqwater, January 2012
- *Facilities & Property Management Solution - Business Case*, Seqwater, January 2012
- *Water Quality Management System - Proposed Project Definition*, Seqwater, November 2011
- *Citrix Review Architecture Strategy - Project Brief (pre-market Business Case)*, Seqwater, March 2012
- *Enterprise Risk, Compliance and Incidents (eRCI) Solution - Proposed Project Definition*, Seqwater, January 2012
- *Seismic Network Consolidation - Proposed Project Definition*, Seqwater, November 2011
- Water Billing and Trading Solution - Proposed Project Definition, Seqwater, November 2011
- *xls re costs.xlsx*, Seqwater, no dated

7.11.4. Prudency

Cost driver

The cost driver nominated by Seqwater for this overall project (program) is *improvement*.

The primary driver for the projects has been assessed to vary across the projects from improvement, though renewal to compliance, with improvement comprising the largest value.

Decision making process

Table 80, below, outlines the current status of the projects within the Business Driven Projects from ICT Ops Plan Plant and Equipment project.

Table 80 Project status

Project		Phase
1	Website Redevelopment Project	Start Up phase - Project brief currently being written

Project		Phase
2	Facilities and Property Management	Start Up phase - Business case has been approved
3	Water Quality Management System	Pre-Project phase - Project definition being determined
4	Citrix Review Architecture Strategy	Pre-Project phase - Business case currently being written
5	Enterprise Compliance and Risk Management	Pre-Project phase - Project definition being determined
6	Seismic Network consolidation	Pre-Project phase - Project definition being determined
7	Water Billing and Trading Solution	Pre-Project phase - Project definition being determined

Table 81, below, outlines the projects for which an options assessment and NPV analysis have been undertaken.

- **Table 81 Options assessment and NPV analysis**

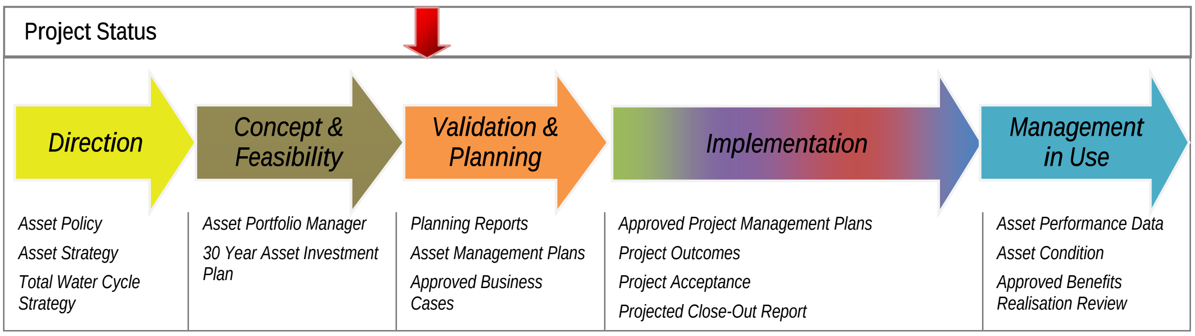
Project		Options assessment completed	NPV
1	Website Redevelopment Project	Y	Y
2	Facilities and Property Management	Y	Y
3	Water Quality Management System	N	N
4	Citrix Review Architecture Strategy	Y	Y
5	Enterprise Compliance and Risk Management	N	N
6	Seismic Network consolidation	N	N
7	Water Billing and Trading Solution	N	N

Based on the status of the individual projects the decision making process is appropriate. The standard process is expected to be followed for Projects 3, 5 6 and 7.

The project has been assessed as prudent. The primary driver of *improvement* has been demonstrated. An appropriate decision making process has been documented.

7.11.5. Efficiency

The estimate of the project status is included below.



The scope of works
All projects have a scope of works appropriate for their respective current state.

Standards of works
The standard of works appears to be consistent with industry practice.

Project cost

The cost for each of the projects has been reviewed. Most are based on the industry knowledge of the Project Manager. These estimates are reviewed by the Project Director and if necessary are informal peer review by industry participants (Gartner) is completed. This is assessed as an appropriate process.

The costs associated with project on to five have been assessed as reasonable. For Project 6 reimbursement is expected, will be an expenditure entry and income entry not a net entry therefore reasonable. For Project 7 95% of the costs are associated with shared irrigation schemes. The costs provided are reasonable.

7.11.6. Policy and procedures

The information provided is consistent with Seqwater's policies and procedures.

7.11.7. Timing and deliverability

All of the projects are due for capitalisation by 2012/13. This has been assessed as achievable.

7.11.8. Efficiency gains

Efficiency gains are the core outcome sought from projects 2, 3 and 7. These are not quantifiable at this stage of the projects, but should be assessed as part of a benefit realisation plan.

7.11.9. Allocation of overhead costs

For the projects a contingency has been applied to the external costs only.

7.11.10. Summary

The 2012/13 project (program) is assessed as prudent. The primary driver of improvement has been demonstrated and an appropriate decision making process has been documented.

The 2012/13 project (program) is assessed as efficient as the scope is appropriate, the standards of works are expected to be consistent with industry practice and the preliminary costs are reasonable.

The value of any expenditure not considered to be prudent or efficient is outlined below in **Table 82**. As this is a program of projects and only projects schedules for capitalisation in 2012/13 have been reviewed, it is not possible for an assessment of the prudency and efficiency of later projects to be completed. Consequently these amounts cannot be determined as prudent or efficient. This budget will need to be reviewed when information is available. In additional the quantum of increase in 2013/14 expenditure is too large (+ 188%) to allow approval by projection.

- **Table 82 Business Driven Projects from ICT Ops Plan Plant and Equipment - revised capital expenditure profile**

Project	Costs ($000s)				
	2012/13	2013/14	2014/15	Subsequent	Total
Business Driven Projects from ICT Ops Plan Plant and Equipment	1,700	-	-	-	1,700

The adequacy of the information provided on this project is outlined below in **Table 83**.

Table 83 Adequacy of information provided

Section of Capex review	Business Driven Projects from ICT Ops Plan Plant and Equipment	
Project description		
Provided documentation		
Prudency		
Cost driver		
Decision making process		
Efficiency		
Scope of works		
Standards of work		
Project cost		
Policy and procedures		
Timing and deliverability		
Efficiency gains		
Allocation of overhead costs		
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

7.12. North Stradbroke Island Water Treatment Plant – Lime System Sludge Lagoon

7.12.1. Proposed capital expenditure

Table 84 shows the proposed cost of the North Stradbroke Island Water Treatment Plant – Lime System Sludge Lagoon within the 2012/13 and 2013/14 budgets.

Table 84 North Stradbroke Island Water Treatment Plant – Lime System Sludge – Proposed capital expenditure profile

Source	Costs ($000s)				
	2012/13	2013/14	2014/15	Subsequent	Total
A8 2012-2013 GSC Information Return Capex 2012-13.xlsm	1,075	3,000	-	-	4,075

The written submission appears to be consistent with the data provided within the excel spreadsheets.

7.12.2. Project description

The North Stradbroke Island Water Treatment Plant supplies water to the mainland via the SEQ Eastern interconnector pipeline. The North Stradbroke Island Water Treatment Plant receives raw water from two sources consisting of a freshwater lagoon and bore fields. Seqwater currently holds a licence for water extraction entitlements allowing 35 ML/day and 22.6 ML/day of raw water per day to be extracted from Herring Lagoon and bore fields respectively.

Of the two sources of supply, ground water extracted from bore fields is of a superior, more consistent quality for treatment compared with Herring Lagoon. Treatment of raw water from bore fields only requires pH adjustment and disinfection as the sand on North Stradbroke Island acts as a natural filter. Herring Lagoon however is subject to environmental conditions and has a largely variable raw water quality. This large variability requires a more extensive treatment process of pre-chemical dosing, dissolved air flotation (DAF), filtrations and post chemical dosing to treat the raw water to drinkable water.

Herring Lagoon is regarded as a window lake and is located within the North Stradbroke Island National Park. At present, the State Government is considering extending the national park boundaries.

In order to meet daily demands, Seqwater has been extracting approximately 81% of its capacity from bore fields and only 14% of its allowable capacity from Herring Lagoon as a result of ease of treatment and minimum cost operation. Seqwater has proposed that in order to efficiently meet future demands, they require a transfer of water entitlements and extraction capacities from Herring Lagoon to bore fields to create a more reliable and consistent source of water.

Both the SEQ Water Grid Manager and Seqwater have been in communication with DERM regarding the benefits and efficiencies associated with the transfer of extraction entitlements, however, DERM has not provided a response to date.

Seqwater has advised that this project is being considered with the Capalaba Water Treatment Plant project in sub regional context.

Regardless of the transfer of entitlements, a sludge lagoon has been flagged as necessary for either the current arrangement or one involving a higher number of bore fields. The size of the sludge lagoon will vary with the source of water quality as water from Herring Lagoon produces significantly more sludge than the water from bore fields.

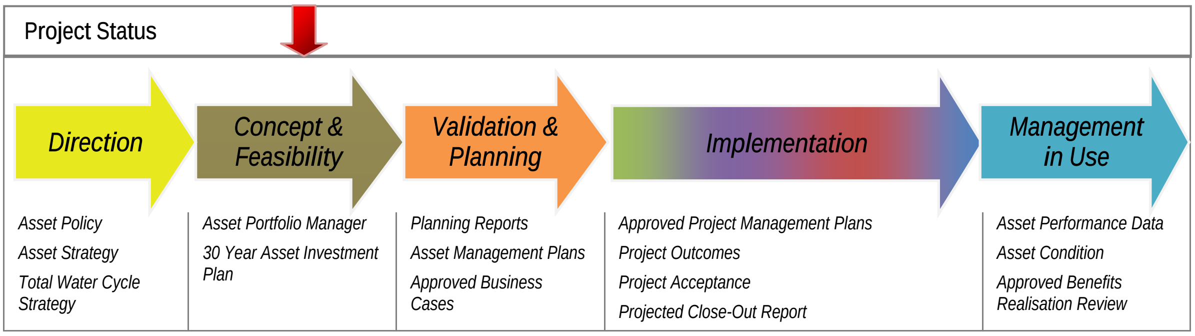
7.12.3. Provided documentation

The key reference documents used for this review are:

- *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm*, Seqwater, February 2012
- *Needs Analysis North Stradbroke Island Water Treatment Plant*, Seqwater, 10 December 2010
- *Letter from WGM to DERM re North Stradbroke Island Water Treatment Plant options*, WGM, 11 August 2011
- *Internal Memorandum re Impacts of DERM proposal – NSI National Park*, Seqwater, 7 October 2011
- *Letter from Seqwater to DERM re North Stradbroke Island Water Treatment Plant options*, Seqwater, 21 September 2011
- *pH Correction Alternatives - Report*, BECA Pty Ltd, March 2011

7.12.4. Prudency

The estimate of the project status is included below.



Cost driver

The cost driver nominated by Seqwater for this project is *improvement*.

Alternatively the Need Analysis indicates that growth and demand is the primary driver as documented in Sections 3 and 7 of the Need Analysis. However in contradiction to this, Sections 5 and 8 of the Need Analysis allude to efficiency outcomes being the key driver. SKM considers that although both these are reasonable; no consistent driver has been nominated.

As part of this review, verbal advice was received that due to resourcing constraints, DERM will not address the issues in the letters sent by the SEQ Water Grid Manager and Seqwater until February 2013.

When considering the information provided within the letters between Seqwater and DERM regarding the transfer of extraction entitlements, it considers the attempt to transfer the allocation of licences to be of future benefit.

As the scope of the project is not defined, based on the information provided, it is not posible to establish the prudency of the project.

It considers the intent to extract primarily from bore fields rather than Herring Lagoon is a more cost effective alternative compared with the existing arrangement.

Decision making process

The decision making process includes comments and advice from an external stakeholder DERM. This is not likely to be received before February 2013. Consequently, the process is not complete.

Seqwater commissioned a consultant (BECA) to undertake an investigation into the three different chemical compounds for pH correction: hydrated lime (calcium hydroxide): $Ca(OH)_2$, caustic (sodium hydroxide): NaOH and soda ash (sodium carbonate): $Na2CO_3$. The overall aim the report was to provide a resource to select the appropriate chemical to adjust treated water pH, and to provide design guidance to enable chemical dosing system design to a concept design level.

The conclusions from this investigation were:

- At sites with a Langelier Saturation Index (LSI) target close to zero (Scenarios 1C, 2C and 3C), lime with CO_2 is the only realistic option. If this is the case, the design process should focus on optimising the design of the lime system for operability and efficiency. (corrosively index frequently used in the water industry)
- If net present cost (NPC) is to be the determining factor in the decision making process; the BECA report indicates:
  - For a water treatment plant of 0.5 ML/day and less soda ash is the lowest NPC option
  - For a water treatment plant of 5 ML/day, the NPC of the three options become similar, with soda ash remaining the lowest NPC option
  - For a water treatment plant of 50 ML/day, the higher chemical purchase cost of the soda ash makes it the highest NPC option, and generally precludes if from use at sites this capacity and greater. Caustic is the most cost effective option at 50ML/day
  - For a water treatment plant of 500 ML/d or larger, lime becomes the lowest NPC option due to the low chemical cost

This is illustrated below in **Table 85**.

- **Table 85 Cost efficiency for different pH correction compounds**

Plant Capacities (ML/d)	Compounds for pH correction		
0.5	Soda Ash	-	-
5	Soda Ash	Caustic	Lime Dosing
50	-	Caustic	Lime Dosing
500	-	-	Lime Dosing

Based on the information provided within the BECA report; either caustic or lime dosing pH correction appear to be valid option for the target Water Treatment Plant capacities. No information has been provided indicating Seqwater's choice of pH correction method other than the title of this project.

It is noted that the BECA report typically responds to the correction of pH levels around 7.0. In the case of North Stradbroke Island, raw water extracted from bore fields typically has a pH of 4.0 and require significantly more chemical compound in order to raise the pH to an acceptable level of around 7.5. This increase in consumables is likely to result in the Net Present Value of the lime system being more favourable.

It is considered that the intent to source higher quality raw water is appropriate, however a primary cost driver has not been established and the decision making process is not completed, so pprudency is yet to be established.

7.12.5. Efficiency

The scope of works

A scope of works cannot be documented until the preferred option is agreed.

Standards of works

The standards of works cannot be determined until the scope of documented.

Project cost

The project cost cannot be accurately determined until the scope of works is documented.

Notwithstanding the above, SKM has utilised the BECA report to assess the proposed value of works. The potential scope of works should include the supply and installation of a new hydrated lime dosing plant, a SCADA system upgrade and the construction of a sludge lagoon.

The BECA report documents pH correction alternatives for Seqwater water treatment plant assets and is not specific to North Stradbroke Island. The report investigates the associated capital and operational costs relating to different pH correction solutions.

Seqwater has indicated that a total cost for capital of $ 4,075,000 is required over two years to supply and install associated upgrade works. Current average demands experienced by the North Stradbroke Island Water Treatment Plant are 23.9ML/day. Using the BECA report and interpolation the following costs for capital works were identified:

- **Table 86 SKM Estimate**

Hydrated Lime Capital Costs	Cost ($)
Lime Silo and delivery	
1 x 15 tonne silo to provide 7 days storage	160,000
Feeder and stand	10,000
Dust filter	5,000
Mixing tank 500L SS tank mixer	35,000
Level transmitter	5,000
Valves and interconnecting pipe work	50,000
Lime skid assembly	15,000
Vibrator	5,000
Screw feeder	
Screw feeder - 23.9 ML/day plant	8,000
Mixer	
1 x 750L D-mix Slurry Batch tank	20,000
Saturator	
Saturator 23.9ML/day	400,000
Dose pumps/pipe work	
Dose pumps/pipe work 23.9ML/day	145,000
Civil building and concrete slab costs	
Capacity 23.9ML/day	157,000
Mechanical installation	
Capacity 23.9ML/day	193,000
Electrical, control and instrumentation	
Capacity 23.9ML/day	153,000
Subtotal	**1,361,000**
Design, specification and commissioning	

Hydrated Lime Capital Costs	Cost ($)
Allowance of 15% (BECA)	204,150
Preliminary and General	
Allowance of 15% (BECA)	204,150
Contingency and rounding	
Allowance of 20% (BECA)	353,860
Total	**2,123,160**

It is noted that sufficient information has not been provided to suggest the extent of works required or the cost involved with construction of a sludge lagoon. Additionally an accurate indication of the associated cost for a SCADA system is difficult to determine at this preliminary design stage. However, it is understood that there is already sufficient SCADA infrastructure in place on NSI to support a hydrated lime dosing arrangement without extensive additional works. It is estimated that the costs associated with additional SCADA infrastructure to cost approximately $ 30,000.

Due to the remote location of North Stradbroke Island and the additional implications that arise due to the surrounding mining site, standard costs for mainland construction have been escalated by a factor of 40%. The increased loading applied had been taken from anecdotal evidence and is greater than the Rawlinson's recommended minimum locality factor. This escalation in price considers the additional costs associate with barge and transportation fees, travel time to and from NSI and any additional accommodation costs.

The capital costs estimated for the hydrated lime dosing at NSI and SCADA are indicated in **Table 87**. SKM considers the costs indicated in the following table to represent an appropriate cost for capital works.

- **Table 87 SKM Estimate**

	Cost ($)
Hydrated lime dosing Capital cost	2,123,160
Remote location factor 40%	849,264
SCADA system	30,000
TOTAL	3,002,424

Comparing this with the GSC return amount of $ 4,075,000 would indicate that the sludge lagoon construction costs are about $ 1,000,000. This is an excessive allowance.

SKM also considered the capital cost associated with the installation of a lime dosing system to accommodate for the plant capacity of 58 ML/day. The differences between the estimated cost build up and the requested $ 4,000,000 were unable to be resolved.

Based on the information made available, an assessment of efficiency of the cost cannot be made. A more accurate breakdown of costs and information supporting the size of the sludge lagoon is required before further investigations into efficiencies can be undertaken.

7.12.6. Policy and procedures

Insufficient progress has been made to determine consistency with Seqwater procedures

7.12.7. Timing and deliverability

Based on the verbal advice that DERM are unlikely to provide a response until February 2013, it is improbable that any construction costs will be expended before January 2013.

7.12.8. Efficiency gains

Efficiency gains can be achieved through a lower associated treatment cost as a result of changing the raw water extraction method from Herring Lagoon to bore fields.

7.12.9. Allocation of overhead costs

There is insufficient information provided regarding disaggregation of costs to determine the allocation of overhead costs to the project.

7.12.10. Summary

The intent to source higher quality raw water is appropriate, however a primary cost driver has not been established and the decision making process is not completed. Consequently, prudency is yet to be established.

The efficiency of the project cannot be assessed.

It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information should include:

- Confirmation from DERM regarding the ability to transfer existing water extraction licences
- Information regarding the choice of pH correction chemical compound
- A detailed scope of works
- Information indicating the capacity of the sludge lagoon with accompanying justification and preliminary drawings
- A cost breakdown of Seqwater's supply and install costs for the lime dosing configuration

The value of expenditure considered to be prudent and efficient is outlined below in **Table 88**.

- **Table 88 NSI lime system sludge lagoon - revised capital expenditure profile**

Project	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
NSI lime system sludge lagoon	-	0	-	-	-	0

It is noted that investigation and design costs will be required. However, we are not able to determine these at this stage.

The adequacy of the information provided on this project are outlined below in **Table 89**.

- **Table 89 Adequacy of information provided**

Section of Capex review	NSI Lime System Sludge Lagoon		
Project description			
Provided documentation			
Prudency			
Cost driver			
Decision making process			
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

7.13. Gold Coast Desalination Plant Repairs and Maintenance Asset Replacement

7.13.1. Proposed capital expenditure

Table 90 shows the proposed cost of the Gold Coast Desalination Plant Repairs and Maintenance Asset Replacement within the 2012/13 budget.

- **Table 90 Gold Coast Desalination Plant Repairs and Maintenance Asset Replacement – proposed capital expenditure profile**

Source	Costs ($000s)				
	2012/13	2013/14	2014/15	Subsequent	Total
A8 2012-2013 GSC Information Return Capex 2012-13.xlsm	3,812	-	-	-	3,812
Spreadsheet – GCDP Asset Replacement Costs Calculation	3,812	-	-	-	3,812

The information provided in the cost calculation spreadsheet is consistent with the costs provided in Seqwater's submission to the Authority.

7.13.2. Project description

The Gold Coast Desalination Plant Repairs and Maintenance Asset Replacement project involves the supply and installation of new reverse osmosis (RO) membranes and cartridge filters to continue to meet the contractual water quality requirements. As part of this project it has been nominated that 30% of the membranes will be replaced as well as 30% of RO first pass filter cartridges and 2% of RO second pass filter cartridges.

7.13.3. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm*, Seqwater, February 2012
- *Spreadsheet – GCDP Asset Replacement Costs Calculation*, Seqwater, undated

7.13.4. Prudency

Cost driver

The cost driver nominated by Seqwater for this project is *renewal*.

No documentation has been provided to date confirming this cost driver. However, membranes and filter cartridges by their nature are required to be replaced on a periodic basis, due to deterioration of the filtering material with the consequent increase in renewables consumption and reduction in the quality of water being produced. The business case for the replacement of the membranes and filter cartridges is currently being developed and as such has not been provided.

Decision making process

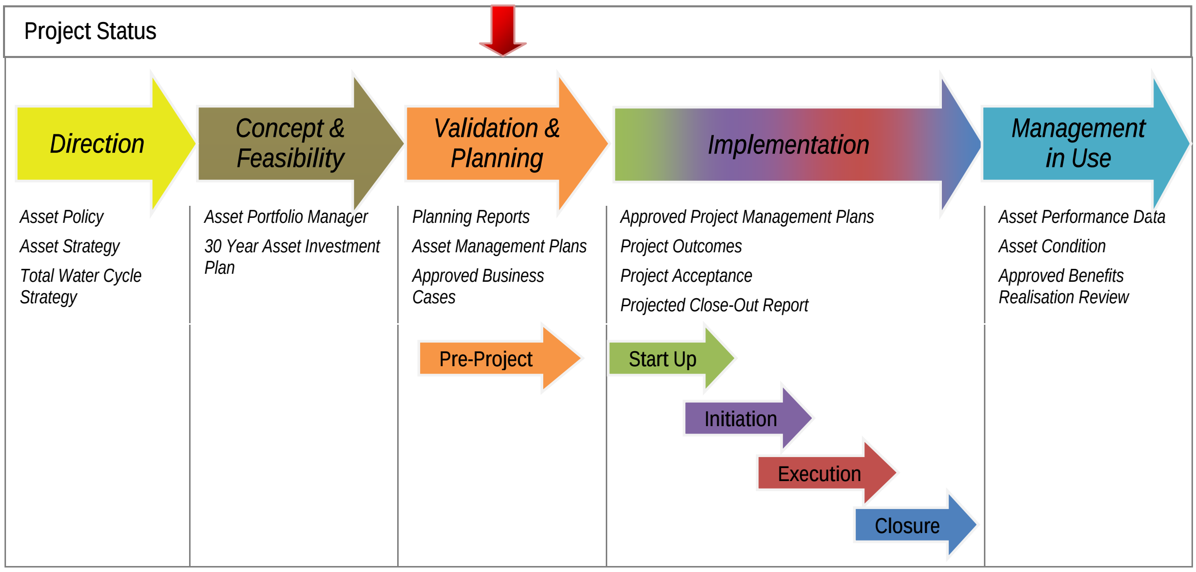
No documented decision making process has been provided by Seqwater as to how the decision to replace 30% of the membranes, 30% of first pass RO filter cartridges and 2% of second pass RO filter cartridges has been reached. Seqwater have verbally advised that the 30% replacement for the membranes was determined based on the experience of the Ashkelon, Israel Desalination facility, which is operated by Veolia Water. It is noted that whilst there are similarities between the Gold Coast and Ashkelon desalination facilities there are also some significant differences. Based on the differences it is expected that the 30% replacement ratio is the highest ratio expected. To more accurately confirm this percentage, more and site specific assessment will be conducted in the near future (before September 2012) to allow the membrane and cartridge replacement to be completed before December 2012.

It is noted that the required operation of the plant has been significantly less than the design and expected operation, due to rainfall, reduced water demand and the use of other sources of drinking water. As such no replacement of membranes and cartridges has occurred to since the plant began operation in 2009. An allowance of 5% per annum for the replacement of membranes and cartridges is included in the budget.

The project has been assessed as prudent. The primary driver of renewal has been demonstrated. An appropriate decision making process has not been documented however as the project is in the early development phase, this is acceptable.

7.13.5. Efficiency

The estimate of the project status is included below.



The scope of works

The scope of work for the project is proposed to include the replacement of 30% of membranes, 30% of first pass RO filter cartridges and 2% of second pass RO filter cartridges including labour associated with these works. Seqwater advise that the actual number of cartridges to be replaced will be refined with the development of the business case and further investigations.

Based on the available information SKM assess that is an appropriate scope of works for the project.

Standards of works

No information has been provided on the standard of works that the project will conform to. It is however expected that the works will conform to technical, design and construction legislative and industry requirements.

Project cost

A detailed preliminary cost breakdown was provided by Seqwater, a high level overview is provided below in **Table 91**.

- **Table 91 Detailed preliminary cost breakdown**

Component	Cost ($)
Membrane replacement	1,112,870
Cartridge replacement	2,076,502
SUB-TOTAL	3,189,372
Indexation 2012 (3.0% of sub-total)	95,681
Indexation 2013 (3.6% of sub-total)	118,262
Service Fee (12.0% of sub-total)	408,398
TOTAL	3,811,712

Source: *Spreadsheet – GCDP Asset Replacement Costs Calculation*, Seqwater, undated

Seqwater advise that the preliminary cost estimate for the project was developed from the RO membranes purchase order from the supplier, dated July 2010. SKM consider that this is an appropriate method to calculate a preliminary cost estimate for a project in the 'Pre-Project' phase of development. SKM understand that once further investigation has been undertaken into the precise number of membranes and filter cartridges that require replacement and the business case has been completed a revised cost estimate will be developed.

7.13.6. Policy and procedures

No standard documentation has been provided in relation to this project as it is in the early stages of development. It is believed that the standard process for the approval of a project within Seqwater will be followed.

7.13.7. Timing and deliverability

The project is proposed to be complete within the 2012/13 financial year. Seqwater have verbally advised that they would like to have the replacement of membranes complete prior to the start of 2012/13 summer. This will require the investigations into the actual number of membranes required to be replaced to be completed by mid 2012 to allow sufficient time for the development of the business case, approval and completion of the replacement.

7.13.8. Efficiency gains

No efficiency gains have been identified for this project.

7.13.9. Allocation of overhead costs

In the cost estimate information provided by Seqwater, a [redacted] service fee for the Veolia Water Alliance has been included however no other information on the allocation of overhead costs has been provided.

7.13.10. Summary

The project is assessed as prudent. The primary driver of renewal has been demonstrated and an appropriate decision making process for the stage of the project documented.

The project is assessed as efficient as the scope is appropriate, the standards of works are expected to be consistent with industry practice and the preliminary costs are defendable. It is noted that the cost estimate is based on preliminary estimate only.

The value of expenditure not considered to be prudent or efficient: Nil.

It is recommended that an ex-post review to be undertaken of the project including:

- Completed Business Case
- Outcomes of study
- Revised scope
- Costs

The adequacy of the information provided on this project is outlined below in **Table 92**.

- **Table 92 Adequacy of information provided**

Section of Capex review	GCDP Repairs & Maintenance	
Project description		
Provided documentation		
Prudency		
Cost driver		
Decision making process		
Efficiency		
Scope of works		
Standards of work		
Project cost		
Policy and procedures		
Timing and deliverability		
Efficiency gains		
Allocation of overhead costs		
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

7.14. Gold Coast Desalination Plant Autoflush SAF Pumps Headers project

7.14.1. Proposed capital expenditure

Table 93 shows the proposed cost of the Gold Coast Desalination Plant Autoflush SAF Pumps Headers project within the 2012/13 budget.

- **Table 93 Gold Coast Desalination Plant Autoflush SAF Pumps Headers project – Proposed capital expenditure profile**

Source	Costs ($000s)				
	2012/13	2013/14	2014/15	Subsequent	Total
A8 2012-2013 GSC Information Return Capex 2012-13.xlsm	1,975	-	-	-	1,975
Preliminary Business Case	2,129	-	-	-	2,129

The information provided in the preliminary business case is not consistent with the costs within Seqwater's submission to the Authority.

7.14.2. Project description

The Gold Coast Desalination Plant Autoflush SAF Pumps Headers project involves the automation of the flushing of the SAF pumps and associated pipework. Since the introduction of "Hot Standby" mode of operation, there is now an operational requirement to perform flushes twice weekly. Historically, zero flushing has been required under the normal mode of operation.

The seawater pumps and headers at the Gold Coast Desalination Plant are currently flushed manually by way of flexible hoses when required. Seqwater advise that the current process is extremely labour intensive and there is a potential for personnel manual handling injuries, as well as flexible hoses posing various trip hazards at and adjacent to the flushing locations around the plant.

Seqwater have verbally advised that an agreement has been reached with the construction phase Alliance that the manual flushing system should have been included in the original scope of works while the automation of the flushing system could not have been foreseen as a requirement at the time of developing the plant. As such the expenditure for the manual flushing system will covered by the Alliance (approximately $ 400,000) and the remainder for the automation of the flushing system include in the budget submission to the Authority (approximately $ 1.5 million).

7.14.3. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm*, Seqwater, February 2012
- *Preliminary Business Case for Super Duplex Pump and Header Draining and Flushing at the Gold Coast Desalination Plant*, Seqwater, February 2012

7.14.4. Prudency

Cost driver

The cost driver nominated by Seqwater for this project is *renewal*.

From conversations with Seqwater, the decision to automate the flushing system was multi-factorial with contributions from efficiency improvement, safety and reduced pipework deterioration. Based on this advice SKM believe that business efficiency (capital expenditure designed to improve operational efficiency and reduce ongoing costs) and service (capital expenditure associated with upgrading service outcomes to improve asset efficiency, reliability or increase the anticipated life of an asset to prevent service non-compliance or capacity shortfall) are more appropriate cost drivers for the project. This is supported by the *Preliminary Business Case for Super Duplex Pump and Header Draining and Flushing at the Gold Coast Desalination Plant* states that the objectives of the project are:

- *"Provide an automatic flushing system to sea water pumps and super duplex stainless steel Reverse Osmosis pipe work (train feed headers)*
- *Automation to ensure that pumps and pipe work are regularly flushed during "Hot standby" Plant operation and to provide flushing of pumps that have been on standby mode for extended periods*
- *Eliminate the need to flush plant manually thereby eliminating the commitment of resources to perform the required tasks to achieve manual flushing.*
- *Extend life of plant and equipment by reducing corrosion issues associated with seawater conveyance*

- *Mitigate risks of manual handling injuries due to the extensive manual handing of laying out and connection/disconnection of flexible piping.*
- *Mitigate the risks of introducing trip hazards at and adjacent to the areas of manual flushing"*

Decision making process

An options analysis, including the 'do nothing' option, has been undertaken. A number of options were identified in the *Preliminary Business Case for Super Duplex Pump and Header Draining and Flushing at the Gold Coast Desalination Plant* (Seqwater, February 2012) these were:

Option 1 Do nothing

Option 2 Manual flushing system

Option 3 Automated flushing system

The estimated costs, advantages and disadvantages associated with each of the options were determined and a conclusion drawn on whether the option met the business needs, as outlined below in **Table 94**.

Table 94 Seqwater options analysis

Option	Estimated cost ($)	Advantages	Disadvantages	Meets business needs
1 - Do nothing	0	No capital outlay	Ties up operator labour Increased safety risk Increased risk of asset deterioration Poor practice	No
2 - Manual flushing system	431,000	Minimum solution addressing safety risks	Increased maintenance costs – operator labour Increased safety risk Increased risk of asset deterioration Not consistent with best practice	Partial
3 - Automated flushing system	2,129,000	Reduced maintenance costs Reduced safety risk exposure Reduced risk of asset deterioration	Capex cost	Yes

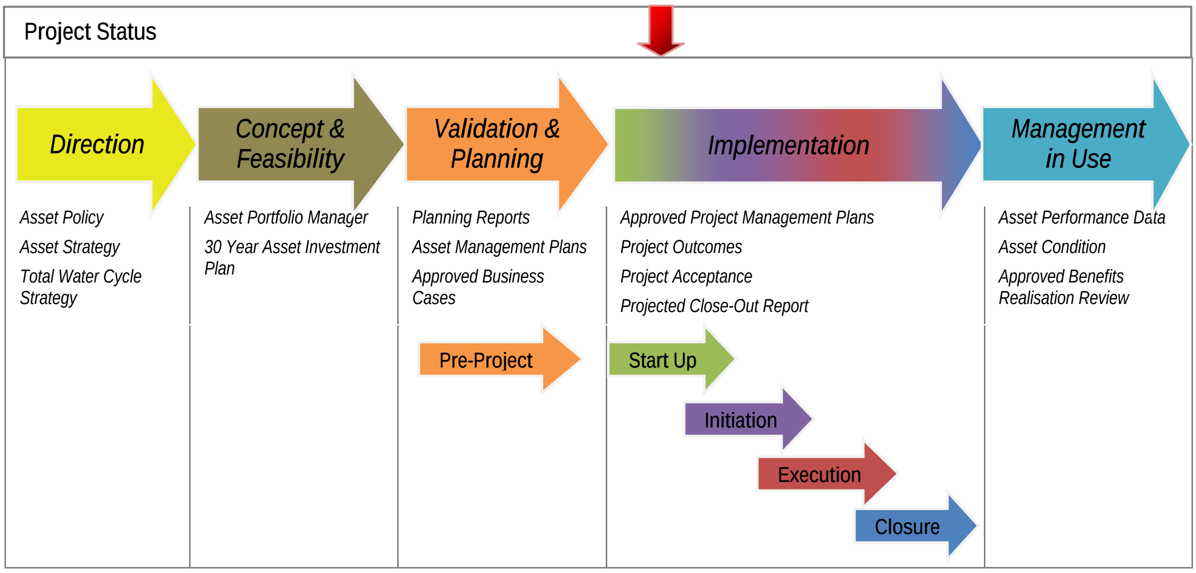
Source: *Preliminary Business Case for Super Duplex Pump and Header Draining and Flushing at the Gold Coast Desalination Plant*, Seqwater, February 2012

The preferred option is Option 3 - Automated flushing system as it is *"the most efficient at meeting the business need, fulfilling the projects objectives and delivering the required benefits to Seqwater."* The *Preliminary Business Case for Super Duplex Pump and Header Draining and Flushing at the Gold Coast Desalination Plant* states that:

> *"A NPV assessment of the short listed options will be performed when the full business case is developed."*

The project has been assessed as prudent. The primary cost driver has been assessed as business efficiency. An appropriate decision making process has been documented.

7.14.5. Efficiency



The scope of works

The scope of work for this project, as documented in the *Preliminary Business Case for Super Duplex Pump and Header Draining and Flushing at the Gold Coast Desalination Plant*, will include *"supply, delivery, installation and commissioning of all equipment necessary to complete the project including piping, valves, automated actuators, software changes, electrical equipment."*

Based on the provided information we assess that the scope of works is appropriate.

Standards of works

No information has been provided on the standard of works that the project will conform to. It is however expected that the works will be required to conform to technical, design and construction legislative and industry requirements.

Project cost

A cost estimate to complete the project was undertaken as part of the preliminary business case, as outlined below in **Table 95**. This estimate included a contingency of ± 15% and [redacted] for executing the works under the Veolia Water Alliance. The preliminary business case indicated that the estimate would be further refined during the development of a full business case.

- **Table 95 Budget estimate**

Budget Estimate		Cost ($)
VWA Costs		
External Costs		1,625,650
SAF Pump Draining and Flushing	937,560	
Plant Draining and Flushing	691,090	
Consultants		

Travel, Accom & Entertainment		
Other	24,000	
Costs Estimate		1,625,650
Contingency (15%)		247,898
[redacted]		
Total Budget Estimate (excl GST)		[redacted]

Source: *Preliminary Business Case for Super Duplex Pump and Header Draining and Flushing at the Gold Coast Desalination Plant*, Seqwater, February 2012

Preliminary information indicates that the cost of the manual flushing is $ 431,000.

The difference between the GSC submission and the preliminary Business Case has not been established.

7.14.6. Policy and procedures

A preliminary business case has been developed for the project. For the status of the project, the process followed to date is generally consistent with Seqwater's procedures.

7.14.7. Timing and deliverability

The project is proposed to complete within the 2012/13 financial year. Based on the provided information SKM assess this as achievable.

7.14.8. Efficiency gains

Efficiency gains are the subject matter of this project. The quantitative benefit has not been determined and a benefit realisation plan should be created.

7.14.9. Allocation of overhead costs

The cost estimate included a 15% contingency and a [redacted] service fee both on the cost estimate.

7.14.10. Summary

Whilst the preliminary Business Case requires updating, the project is assessed as prudent as the primary drivers of business efficiency has been demonstrated and a subordinate driver of service is also relevant and an appropriate decision making process

The project is assessed as efficient as the scope which requires more definition is acceptable, the standards of works are expected to be consistent with industry practice and the amended costs appear reasonable.

The value of expenditure considered to be prudent and efficient is outlined below in **Table 95**.

Table 96 GCDP Autoflush SAF Pumps Header project - revised capital expenditure profile

Project	Costs ($000s)				
	2012/13	2013/14	2014/15	Subsequent	Total
GCDP Autoflush SAF Pumps Header	1,544	0	0	0	1,544

It is recommended that for an ex-post review to be undertaken of the project including:

- Business Case
- Scope
- Reviewed Costs
- Later review recommendation

The adequacy of the information provided on this project is outlined below in **Table 97**.

Table 97 Adequacy of information provided

Section of Capex review	GCDP Autoflush SAF Pumps Header		
Project description			
Provided documentation			
Prudency			
Cost driver			
Decision making process			
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

7.15. Lowood Water Treatment Plant – Sludge handling improvements and other works

7.15.1. Proposed capital expenditure

Table 98 shows the proposed cost of the Lowood Water Treatment Plant – Sludge handling improvements and other works within the 2011/12 to 2013/14 budgets.

- **Table 98 Lowood Water Treatment Plant – Sludge handling improvements and other works – Proposed capital expenditure profile**

Source	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
A8 2012-2013 GSC Information Return Capex 2012-13.xlsm	300	2,000	1,000	-	-	3,300
Needs Analysis: Lowood WTP Sludge Handling Options Assessment	100	3,900	-	-	-	4,000

The information provided in the needs analysis is not consistent with the costs within Seqwater's submission to the Authority. No explanation of the difference has been provided by Seqwater.

7.15.2. Project description

The Lowood Water Treatment Plant – Sludge handling improvements and other works project involves further analysis of potential options and preliminary design of the preferred option to allow the works to proceed to design and construction. A consultancy to assess the most cost effective method of improving the sludge handling capacity was recently awarded by Seqwater.

The Lowood Water Treatment Plant is located at the top of Reservoir Road, Lowood and is a conventional sedimentation and filtration treatment plant commissioned in 1989. The plant supplies Lowood, Fernvale and the Lockyer Valley, including the towns of Gatton, Laidley and Forest Hill. The supply zone is not connected to the Water Grid so the plant provides the sole source of drinking water for these communities.

The Lowood Water Treatment Plant treats raw water directly from Lockyer Creek through releases from Wivenhoe Dam. The raw water releases from Wivenhoe Dam flow into Lockyer Creek and consequently is of moderate turbidity and run of the river flows in Lockyer Creek are variable in quality. The effect of flows from the Lockyer Creek catchment on raw water turbidity is even more extreme. The sludge handling system at Lowood Water Treatment Plant consists of a backwash recovery tank and sludge drying beds. Wet weather results in two main issues: 1) increases turbidity in raw water and an increased solids loading and 2) reduced drying capacity as evaporation is reduced and precipitation falls into the drying beds. Consequently the drying beds can become overloaded. In addition during the January 2011 wet weather event the backwash recovery tank overflowed due to the excessive number of backwashes required because of the poor quality raw water. This overflow crossed the plant boundary and entered a neighbouring property. At present the plant is operating well below 50% capacity and the sludge handling system is struggling to handle the current load requiring Geotubes to be employed in parallel to the drying beds to increase the sludge handling capacity of the plant.

7.15.3. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm*, Seqwater, February 2012
- *Needs Analysis: Lowood and Esk WTP*, Seqwater, December 2010
- *Needs Analysis: Lowood WTP Sludge Handling Options Assessment*, Seqwater, October 2011
- *Project Brief - Options Study and Preliminary Design Image Flat WTP Chemical Dosing and Sludge Handling Facilities and Lowood WTP Sludge Handling Facilities*, Seqwater, November 2011
- *Water Treatment Sludge Handling: Response to wet weather events*, AECOM, November 2011
- *Internal Memorandum Re: Options Study and Preliminary Design Image Flat WTP Chemical Dosing and Sludge Handling Facilities and Lowood WTP Sludge Handling Facilities*, Seqwater, 13 December 2011
- *Seqwater Sludge Management Plan Strategy Report*, Hunter Water Australia, September 2011
- *Seqwater Sludge Management Plan Strategy Report – Appendix F: a_Cost Estimation Spreadsheet*, Hunter Water Australia, September 2011

7.15.4. Prudency

Cost driver

The cost driver nominated by Seqwater for this project is *compliance*.

This cost driver is supported by the *Needs Analysis: Lowood WTP Sludge Handling Options Assessment* (Seqwater, October 2011) which included the following table:

Table 99 Seqwater identified cost drivers by category

Driver / Need	Specific Requirements	Associated Risk		Risk Rating*
		Consequence	Likelihood	
Demand/growth	The current plant capacity as stated in the HACCP Plan (2011) is 19 ML/d. Under high turbidity and extreme wet weather conditions sludge production increases by more than 10 times average resulting in excess loadings on the solids handling system. It is estimated that due to population growth in the supply area, demand will increase to 30 ML/d in 2031 (MDMM).	Moderate Key issue is to remove constraints to plant production under high rainfall/flood events.	Likely	High
Regulatory compliance	Potential overflow of backwash balance tank and temporary sludge storage on site during and following high rainfall periods when drying beds become overloaded.	High	Possible	High
Contractual compliance	Maximum throughput was as high as 12 ML/d over the 2010/11 summer compared to average demand of 6 – 7 ML/d. Improvements to sludge handling should assist in improving plant capability under high rainfall/flooding events. Grid Instructions require the plant to produce up to 20 ML/d in 2011.	Moderate	Likely	High

Driver / Need	Specific Requirements	Associated Risk		Risk Rating*
		Consequence	Likelihood	
Improvements	Reports by Hunter Water and AECOM have identified the need for augmentation of the sludge handling system for production reasons. The Hunter Water report notes that the plant sludge area cannot cope with the high alum doses at typical or high production rates and that vessel volumes are not sized to cope. The backwash recovery tank is undersized.	-	-	-
Efficiency	Additional time is required from operational staff to manage the sludge dewatering during high rainfall events.	-	-	-

Source: *Needs Analysis: Lowood WTP Sludge Handling Options Assessment* (Seqwater, October 2011)

The *Needs Analysis: Lowood WTP Sludge Handling Options Assessment* (Seqwater, October 2011) states:

> *"At present the plant is operating well below 50% capacity and the sludge handling system is struggling to handle the current load. Geotubes are currently being employed as a temporary measure in parallel to the drying beds to increase the sludge handling capacity of the plant. In addition during a high rainfall event earlier this year the backwash water balance tank overflowed into a neighbouring property. This was due to the increased frequency of backwashing of the filters that was required because of the high turbidity in the water."*

Decision making process

An options analysis was completed, this did not include in 'do nothing' option. The *Seqwater Sludge Management Plan Strategy Report* (Hunter Water Australia, September 2011) was undertaken to identify the most likely options available for Seqwater's water treatment plants as a whole. This is included an assessment of a number of options specifically for Lowood Water Treatment Plant. These were:

Option 1 Sewer disposal
Option 2 Permanent volute mechanical dewatering facility
Option 3 Sludge lagoons

The preferred option from this study was found to be sewer disposal as it was estimated to be the most cost effective followed by sludge lagoons. The study identified that further investigation into the capacity of the receiving wastewater treatment plant would need to be conducted and approval from Queensland Urban Utilities, the owner and operator, required for this option to be feasible. An NPV analysis was conducted (for a 20 year period at 7%) on each of the options, as outlined in **Table 100**, however only information on the preferred options is available. The NPV of the options included estimated trade waste charges.

Table 100 Hunter Water Australia NPV analysis

Option	Capex ($)	Opex ($)	NPV ($)
Option 1: Sewer disposal	52,319	46,636	546,389

Option	Capex ($)	Opex ($)	NPV ($)
Option 2: Permanent volute mechanical dewatering facility	3,488,367	NA	4,267,482
Option 3: Sludge lagoons	927,591	17,364	136,337

Source: *Project Brief - Options Study and Preliminary Design Image Flat WTP Chemical Dosing and Sludge Handling Facilities and Lowood WTP Sludge Handling Facilities* (Seqwater, November 2011)

The *Water Treatment Sludge Handling: Response to wet weather events* (AECOM, November 2011) report was undertaken in response to the issues identified after the flood and made recommendations with regard to how sludge handling facilities could be upgraded in order to better handle another period of exceptional weather events. This study identified a number of potential options for further investigation for Lowood Water Treatment Plant, as outlined below in **Table 101**, but it was outside of the scope of the project to conduct in depth analysis of the identified options.

- **Table 101 AECOM options for further investigation**

Option	Initial Recommendations
Optimise Storage (utilise existing, sludge return)	Modify operating procedure to ensure optimum use of storage capacity in the drying beds
Additional Dewatering	Make provision (services) for temporary dewatering unit to be installed when required, including sludge storage bay
New Storage	Prepare design and tender documents for extension of existing drying beds

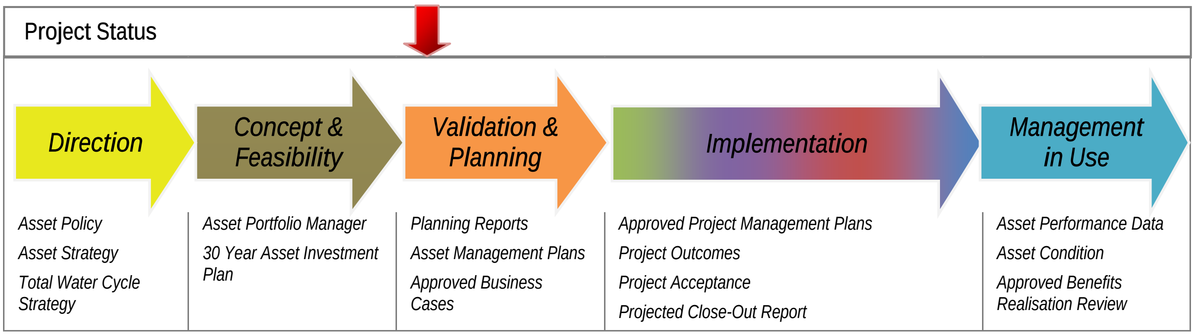
Source: *Water Treatment Sludge Handling: Response to wet weather events* (AECOM, November 2011)

Seqwater released the *Project Brief - Options Study and Preliminary Design Image Flat WTP Chemical Dosing and Sludge Handling Facilities and Lowood WTP Sludge Handling Facilities* (Seqwater, November 2011) late last year to conduct further investigations into the long term sludge handling options for Lowood Water Treatment Plant. The final outcome of this investigation is not expected until May 2012. Seqwater state that *"The outputs from the project will enable Seqwater to develop a business case for the implementation of the project and if approved the preliminary design would be used as the basis for developing detailed designs for the plant"*. A final decision on the preferred option to proceed with will not be determined by Seqwater until the consultancy has been completed and the findings are presented.

The project is assessed as prudent. An appropriate decision making process has been documented to date, including the commissioning of a comprehensive options study.

7.15.5. Efficiency

The estimate of the project status is included below.



The scope of works

The scope of works for this project has not yet been determined as it is currently in the options assessment and preliminary design phase.

Standards of works

No information has been provided on the standard of works that the project will conform to. It is however expected that the works will be required to conform to technical, design and construction legislative and industry requirements.

Project cost

For the 2012/13 budget Seqwater have estimated a budget value of $ 2 million, however in the *Needs Analysis: Lowood and Esk WTP* (Seqwater, October 2011) the estimated expenditure for 2012/13 is $ 3.9 million. Seqwater have stated that the estimated expenditure for both values has been based on the outcomes the *Seqwater Sludge Management Plan Strategy Report* (Hunter Water Australia, September 2011). An explanation of the difference between cost estimates have not been provided by Seqwater. It is expected that once the options assessment and preliminary design have been completed a more detailed and accurate cost estimate for the works will be developed.

Whilst SKM believe that developing a preliminary cost estimate based on the outcomes of the previous options assessment is an appropriate method, in this instance the difference between the cost of possible solution (approximately $ 5,200 and $ 93,000) and highest price solution ($ 3.5 million) is too large to incorporate the highest cost as a reasonable estimate. It is suggested that once the options assessment and preliminary design have been completed a further review of the cost estimate is conducted to assess the costs associated with the preferred option.

7.15.6. Policy and procedures

Seqwater have followed their procurement process for the engagement of consultants to conduct the options study and preliminary design of the sludge handling facilities at Lowood Water Treatment Plant. A tender process was followed with four tender submissions evaluated on the criteria of project appreciation and methodology (25%), resources (25%), company track record/experience (10%), timely delivery and program (20%) and Cost (20%). The evaluation process resulted in the selection of the highest ranked consultant based on the criteria.

No business case has been developed for the project as the project is in the 'Pre-Project' phase and such documentation is not required until the 'Start Up'. It is believed that the standard process for the approval of a project within Seqwater will be followed as the project progresses.

7.15.7. Timing and deliverability

The *Needs Analysis: Lowood WTP Sludge Handling Options Assessment* (Seqwater, October 2011) identifies that:

> *"Critical success factors are:*
>
> - *Completion of the project sufficiently to enable the submission of a business case for approval in the 11/12 FY so that the permanent upgrade can occur in the 12/13 FY prior to the wet season;*
> - *Approval of the business case in the 11/12 FY;*
> - *Development of a sludge handling system which is compliant with Seqwater overall strategic objectives, and is suitable for the plant, its site, and its short and long term needs; and*
> - *Construction /installation of the system in the 12/13 FY prior to the wet season."*

Given that the options study is currently being undertaken, with the final draft to be submitted in May 2012, the business case would need to be developed, submitted and approved in the following month. This leaves a very short period time for the construction/installation to be completed prior to the wet season (which can start as early as October). Seqwater have verbally stated that not completing the project prior to the 2012/13 wet season is an acceptable risk as short-term solutions have been implemented, including Geotubes and contingency plans, which reduce the likelihood of compliance issues occurring.

The amount submitted to the Authority delays expenditure into the 2013/14 financial year however the program schedule is not available to identify whether the expenditure will occur before the wet season of 2013/14.

7.15.8. Efficiency gains

No efficiency gains have been identified for this project.

7.15.9. Allocation of overhead costs

No information has been provided by Seqwater in relation to allocation of overheads to this project. However as the project is in the options assessment and preliminary design phase a detailed cost estimate has not yet been completed.

7.15.10. Summary

The project is assessed as prudent. The primary driver of compliance has been demonstrated and an appropriate decision making process has been documented.

The project is not sufficiently progressed to demonstrate the selection of an efficient option. Similarly the scope and standard of works are not defined.

Consequently the continued investigation is prudent however the capital expenditure of the solution can not be confirmed as efficient.

The value of any expenditure not considered to be prudent or efficient is outlined below in **Table 102**.

- **Table 102 Lowood Water Treatment Plant – Sludge handling improvements and other works - revised capital expenditure profile**

Project	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
Lowood Water Treatment Plant – Sludge handling improvements and other works	300	-	-	-	-	300

Notwithstanding that the amount for 2012/13 and 2013/14 are not able to be approved due to inadequate scope definition and cost estimation, when this has been resolved budgets can be allocated.

To enable an assessment to be completed the following information is required:

- Options Assessment report including costs
- Tender review report for engagement of consultant for Options Assessment
- Business Case
- Information on project timeline

The adequacy of the information provided on this project is outlined below in **Table 103**.

- **Table 103 Adequacy of information provided**

Section of Capex review	Lowood WTP – Sludge Handling Improvements		
Project description			
Provided documentation			
Prudency			
Cost driver			
Decision making process			
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

7.16. Molendinar Water Treatment Plant - Upgrade Works

7.16.1. Proposed capital expenditure

Table 104 shows the proposed cost of the Molendinar Water Treatment Plant upgrade works within the 2012/13 budget.

- **Table 104 Molendinar Water Treatment Plant upgrade works – proposed capital expenditure profile**

Source	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
A8 2012-2013 GSC Information Return Capex 2012-13.xlsm	-	2,000	5,000	4,715	-	11,715
Needs Analysis for Molendinar WTP Options	-	8,715	3,000	-	-	11,715

The value of the capital expenditure for the project is consistent between the Needs Analysis and Seqwater's submission to the Authority however the timing of the expenditure is different with the *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm* delaying the expenditure. Given the status of the options assessment, expenditure of $ 8.7 million in the 2012/13 financial year as indicated in the needs analysis does not appear feasible.

7.16.2. Project description

Molendinar Water Treatment Plant, constructed in 1983, is the fourth largest water treatment plant in SEQ and supplies most of the Gold Coast region. It sources and treats water from Hinze Dam which into which Little Nerang Dam flows. The Molendinar Water Treatment Plant has a design capacity of 180 ML/d which is limited to a maximum of 160 ML/d to ensure adequate water quality and disinfection and has an average production of 124 ML/d. The KBR report refers to the maximum capacity as 150 ML/day.

The water resource allocation from Hinze Dam has recently increased from 76,300 ML/year to 84,000 ML/year due to the raising of the Hinze Dam (Stage 3).

The latest Facility Asset Management Plans (FAMPs) and Hazard Analysis and Critical Control Points (HACCP) report identified a number of investments required to bring the Molendinar Water Treatment Plant up to acceptable condition, improve the robustness of the treatment processes, improve operational efficiencies and secure the supply for the southern end of the Water Grid. Currently a long term sub-regional planning review, which includes a condition assessment and refurbishment scoping exercise and development of options for the long term operation of the Molendinar Water Treatment Plant and the nearby Mudgeeraba Water Treatment Plant, is being completed by KBR. The outcomes of this project will identify the required works. The expected completion date for the Molendinar and Mudgeeraba Issues and Options Development study was December 2011, but the final deliverables have not yet been received by Seqwater.

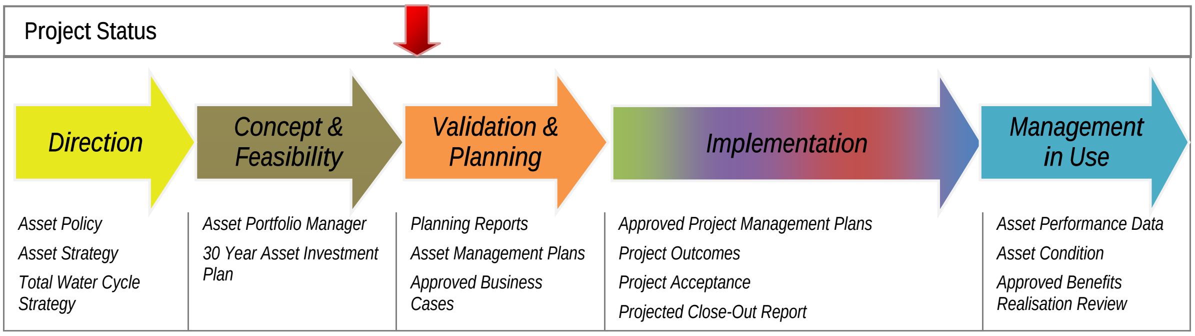
7.16.3. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm*, Seqwater, February 2012
- *Needs Analysis for Molendinar WTP Options*, Version 2, Final, Seqwater, December 2011
- *Consultancy Brief: Molendinar and Mudgeeraba Treatment Plants Issues and Options Development*, Revision 4, Seqwater, June 2011
- *Molendinar Water Treatment Plant HACCP Plan*, Seqwater, June 2010
- *Molendinar Water Purification Plant Process Assessment*, Gold Coast Water, June 2008
- *Facility Asset Management Plan – Molendinar WTP*, Seqwater, March 2011
- *Strategic Water Headworks Planning Report HW1*, GHD, December 2006
- *Condition Assessment of Bulk Water Assets – Molendinar Water Purification Plant*, Draft 1, South East Queensland Water Infrastructure, December 2007
- *Molendinar WPP Replacement of HV Backwash Pumps*, Revision 3, John Wilson and Partners Pty Ltd, May 2008
- *Pg. 6-1 and 6-2 of BEG112-TD-WE-REP-004 Rev.A*, KBR, 2 February 2012

7.16.4. Prudency

The estimate of the project status is included below.



Cost driver

The cost driver nominated by Seqwater for this project is *compliance*, however growth is also listed as a driver in the Needs Analysis.

At this stage SKM is unable to establish whether this driver is appropriate, as the scope of the project is yet to be determined. The Molendinar and Mudgeeraba Issues and Options Development study is not available as at the time of writing. Seqwater expects to receive the finished study shortly, and will then prepare a business case to be signed off in September/October 2012. Once these steps have been completed, an assessment of the prudency of the expenditure and suitability of the driver can be completed.

Investigations conducted by Gold Coast Water prior to the transfer of the Molendinar Water Treatment Plant to Seqwater have been provided. These reports identified a number of improvements and augmentations relevant at the time of production (between 2006 and 2008). As these investigations were conducted prior to the desalination plant and the Water Grid the information outlined may not be relevant to the current situation.

Decision making process

Seqwater has engaged an external consultant (KBR) to undertake a study to determine what options are available for upgrading the Molendinar Water Treatment Plant as part of a sub-regional assessment. This sub-regional study will consider the options for both Molendinar and Mudgeeraba Water Treatment Plants in the larger context of sub-regional water supply, and stakeholders including Gold Coast Water and LinkWater will be included in the discussions.

At present it is not known whether upgrades to both plants are needed, or what is the most appropriate time scale for the upgrades; the options study should provide clarification. In its June 2011 Consultant's Brief, Seqwater identified the following initial options should be considered:

- Catchment investments
- Continued treatment at Molendinar and Mudgeeraba water treatment plants
- Consolidation of treatment facilities at the Molendinar site
- Construction of a new water treatment plant at a new site
- Construction of a new water treatment plant at an alternative site in combination with either of the existing plants

This indicates an options based assessment is being used.

From the two pages of the KBR report the augmentation options as detailed in **Table 105** have been deduced.

Table 105 Molendinar WTP Augmentation Options

Plant Types	Plant Capacity Σ195 (ML/day)		Plant Capacity Σ230 ML/day	
Refurbishment of existing plant & additional conventional plant	150 ML/day 45 ML/day	(Refurb. Existing) (Conventional)	150 ML/day 80 ML/day	(Refurb. Existing) (Conventional)
Commission membrane plant then decommission conventional plant	195 ML/day	(Membrane)	230 ML/day	(Membrane)
Refurbishment of existing plant & additional membrane plant	150 ML/day 45 ML/day	(Refurb. Conventional) (Membrane)	150 ML/day 80 ML/day	(Refurb. Conventional) (Membrane)

This infers that a minimum capacity upgrade of 45 ML/day is planned, with the maximum capacity upgrade of 80 ML/day.

The prudency of the total investment is yet to be established, however it is prudent to complete the options assessment in order to determine the most appropriate path forward. An appropriate decision making process has been documented to date, including the commissioning of a comprehensive options study.

Based on the undertaking to interact with SEQ Water Grid Manager, as documented in **Section 5**, it is expected that the SEQ Water Grid Manager will be involved in discussion.

7.16.5. Efficiency

The project is not at a stage where the scope, cost and standards have been determined. Consequently assessment of the efficiency cannot be commenced.

7.16.6. Policy and procedures

Relative to the project progress to date the policy and procedures appear to comply with Seqwater's policies and procedures.

7.16.7. Timing and deliverability

The project is in the early stages and is not on schedule. Subsequent to the options analysis a business case will need to be prepared and approved followed by a sourcing strategy; implementation schedule and outline of deliverables. The likelihood of expending $ 2 million before June 2013 is improbable.

7.16.8. Efficiency gains

The project is not at a stage where the scope has been determined. Consequently assessment of the efficiency cannot be commenced.

7.16.9. Allocation of overhead costs

The project is not at a stage where the cost has been determined. Consequently assessment of the overhead costs cannot be commenced.

7.16.10. Summary

Prudency is yet to be established however it is prudent to conclude the options assessment in order to determine the most appropriate path forward. An appropriate decision making process has been documented to date, including the commissioning of a comprehensive options study.

Efficiency has not been assessed as prudency is yet to be established.

The value of expenditure considered to be prudent and efficient is outlined below in **Table 106**.

- **Table 106 Molendinar Water Treatment Plant Upgrade - revised capital expenditure profile**

Project	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
Molendinar Water Treatment Plant Upgrade	0	0	0	0	0	0

It is noted that there will be expenditure on project delivery tasks in 2011/12 and 2012/13, however we are not able to determine this at this stage. When the options study is completed a budget should be allocated by Seqwater.

To enable an assessment to be completed the following information is required:

- Advise details of completion of Options Assessment
- Provide Options Report
- Advise date of approved Business Case
- Provide Business Case

The adequacy of the information provided on this project is outlined below in **Table 107**.

Table 107 Adequacy of information provided

Section of Capex review	Molendinar Water Treatment Plant upgrade		
Project description			
Provided documentation			
Prudency			
Cost driver			
Decision making process			
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

7.17. Mudgeeraba Water Treatment Plant - Upgrade Works

7.17.1. Proposed capital expenditure

Table 108 shows the proposed cost of the Mudgeeraba Water Treatment Plant upgrade within the 2012/13 to 2014/15 budgets.

Table 108 Mudgeeraba Water Treatment Plant upgrade – Proposed capital expenditure profile

Source	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
A8 2012-2013 GSC Information Return Capex 2012-13.xlsm	-	2,000	5,000	4,165	-	11,165
Needs Analysis	100	-	-	-	-	100

7.17.2. Project description

Mudgeeraba Water Treatment Plant was constructed in 1967 it sources and treats water from Hinze Dam (primary source) and Little Nerang Dam. It has a design capacity of 110 ML/day when access avaliable to water from both water sources. An upgrade was completed in 2006.

Mudgeeraba is a significant asset for the SEQ Water Grid, particularly the southern Gold Coast and Brisbane areas. This sub-regional demand is meet by supply from Molendinar, Tugun Desalination and more northern facilities such as Mt Crosby and North Pine. There are however some areas of the Gold Coast that can only be effectively supplied from Mudgeeraba.

The water resource allocation from Hinze Dam has recently increased from 76,300 ML/year to 84,000 ML/year due to the raising of the Hinze Dam (Stage 3).

The latest Facility Asset Management Plans (FAMPs) and Hazard Analysis and Critical Control Points (HACCP) Report identified a number of investments required to bring Mudgeeraba Water Treatment Plant into acceptable condition, improve the robustness of the treatment processes, improve operational efficiencies and secure a supply for the southern end of the Water Grid. Currently a long term sub-regional planning review, which includes a condition assessment and refurbishment scoping exercise and development of options for the long term operation of the Mudgeeraba Water Treatment Plant and the nearby Molendinar Water Treatment Plant, is being completed by KBR. The outcomes of this project will identify the required works. The expected completion date for the Molendinar and Mudgeeraba Issues and Options Development study was December 2011, but the final deliverables have not yet been received by Seqwater.

Seqwater have verbally advised that the asset management planning process is expected to determine that the plant requires significant maintenance expenditure to be undertaken in the next one to two years.

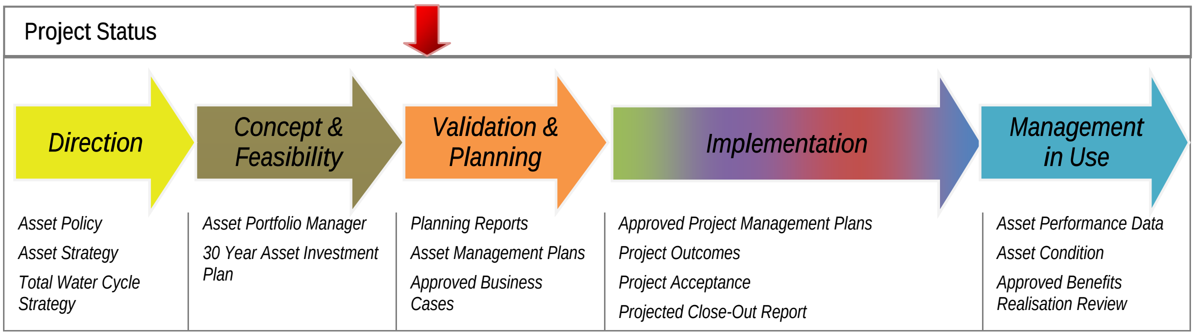
7.17.3. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm*, Seqwater, February 2012
- *Needs Analysis - Mudgeeraba Options Study for Upgrade*, Seqwater, December 2010
- *Mudgeeraba Water Treatment Plant HACCP Plan*, Seqwater, June 2011
- *Facility Asset Management Plan – Mudgeeraba WTP*, Seqwater, December 2010
- *Consultancy Brief: Molendinar and Mudgeeraba Treatment Plants Issues and Options Development,* Revision 4, Seqwater, June 2011
- *Pg. 6-1 and 6-2 of BEG112-TD-WE-REP-004 Rev.A*, KBR, 2 February 2012

7.17.4. Prudency

The estimate of the project status is included below.



Cost driver

The cost driver nominated by Seqwater for this project is *compliance*.

At this stage SKM is unable to establish whether this driver is appropriate, as the scope of the project is yet to be determined. The Molendinar and Mudgeeraba Issues and Options Development study is not available as at the time of writing. Seqwater expects to receive the finished study shortly, and will then prepare a business case to be signed off in September/October 2012. Once these steps have been completed, an assessment of the prudency of the expenditure and suitability of the driver can be completed.

Decision making process

Seqwater has engaged an external consultant (KBR) to undertake a study to determine what options are available for upgrading the Mudgeeraba Water Treatment Plant as part of a sub-regional assessment. This sub-regional study will consider the options for both Molendinar and Mudgeeraba Water Treatment Plants in the larger context of sub-regional water supply, and stakeholders including Gold Coast Water and LinkWater will be included in the discussions.

At present it is not known whether upgrades to both plants are needed, or the most appropriate time scale for the upgrades; the options study should provide clarification. In its June 2011 Consultant's Brief, Seqwater identified the following initial options should be considered:

- Catchment investments
- Continued treatment at Molendinar and Mudgeeraba water treatment plants
- Consolidation of treatment facilities at the Molendinar site
- Construction of a new water treatment plant at a new site
- Construction of a new water treatment plant at an alternative site in combination with either of the existing plants

This indicates an options based assessment is being used. The KBR augmentation options document, suggests that due to the site constraints (size) of the Mudgeeraba Water Treatment Plant, no option would change the current main treatment process. Therefore, refurbishment options of the existing plant with the provisions for future UV installation are the only options being considered.

The prudency of the total investment is yet to be established, however it is prudent to complete the options assessment in order to determine the most appropriate path forward. An appropriate decision making process has been documented to date, including the commissioning of a comprehensive options study.

7.17.5. Efficiency

The project is not at a stage where the scope, cost and standards have been determined. Consequently assessment of the efficiency cannot be commenced.

7.17.6. Policy and procedures

Relative to the project progress to date the policy and procedures appear to comply with Seqwater's policies and procedures.

7.17.7. Timing and deliverability

The project is in the early stages and is not on schedule. Subsequent to the options analysis a business case will need to be prepared and approved followed by a sourcing strategy; implementation schedule and outline of deliverables. The likelihood of expending $ 2 million before June 2013 is improbable.

7.17.8. Efficiency gains

The project is not at a stage where the scope has been determined. Consequently assessment of the efficiency cannot be commenced.

7.17.9. Allocation of overhead costs

The project is not at a stage where the cost has been determined. Consequently assessment of the overhead costs cannot be commenced.

7.17.10. Summary

Prudency is yet to be established however it is prudent to conclude the options assessment in order to determine the most appropriate path forward. An appropriate decision making process has been documented to date, including the commissioning of a comprehensive options study.

Efficiency has not been assessed as prudency is yet to be established.

The value of expenditure considered to be prudent and efficient is outlined below in **Table 109**.

- **Table 109 Mudgeeraba Water Treatment Plant Upgrade - revised capital expenditure profile**

Project	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
Mudgeeraba Water Treatment Plant	0	0	0	0	0	0

Project	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
Upgrade						

It is noted that there will be expenditure on project delivery tasks in 2011/12 and 2012/13, however we are not able to determine this at this stage. When the options study is completed a budget should be approved by Seqwater.

To enable an assessment to be completed the following information is required:

- Advise details of completion of Options Assessment
- Provide Options Report
- Advise date of approved Business Case
- Provide Business Case

The adequacy of the information provided on this project is outlined below in **Table 110**.

- **Table 110 Adequacy of information provided**

Section of Capex review	Mudgeeraba Water Treatment Plant Upgrade		
Project description			
Provided documentation			
Prudency			
Cost driver			
Decision making process			
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

7.18. Holts Hill Chlorine Control Building Foundation Repairs

7.18.1. Proposed capital expenditure

Table 111 shows the proposed cost of the Holts Hill Chlorine Control Building foundation repairs within the 2011/12 and 2012/13 budgets.

- **Table 111 Holts Hill Chlorine Control Building foundation repairs – proposed capital expenditure profile**

Source	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
A8 2012-2013 GSC Information Return Capex 2012-13.xlsm	609	1,654	-	-	-	2,263
Holts Hill Chemical Building Replacement Upgrade Business Case	300	1,654	-	-	-	1,954

The budget for the 2012/13 financial year is consistently reported however a larger sum for 2011/12 has been included in Seqwater's submission to the Authority than is shown in the Business Case. When queried, Seqwater reported that this $ 309,000 consists of the business case project and other renewals works at the Holts Hill site, predominantly related to actuation and refurbishment of valves at the Camerons Hill Reservoirs.

7.18.2. Project description

Holts Hill provides final chemical dosing for water produced by the Mt Crosby Eastbank and Westbank Water Treatment Plants. The Holts Hill chemical building houses the power, control and testing facilities for final chemical dosing of water at the Camerons Hill Reservoirs. The building is located on the edge of a terrace adjacent to a steep slope and there is evidence of subsidence. The slope has been assessed as having an unacceptable risk of failure. Continued subsidence and/or a landslip could compromise the supply and quality of water from the Camerons Hill Reservoirs by impacting the chemical building and adjacent mains.

The existing chlorine control building is a single storey brick structure, constructed on a reinforced concrete slab with strip footings beneath the brick walls. It is approximately 10.5 m by 20 m in plan, and houses the following:

- Storeroom, which was the old chlorine drum room
- Air compressor for ammonia batching
- Control room PLC, SCADA and UPS, operator desk and telephone
- Laboratory
- Substation and backup power supply

The project would involve construction of a new prefabricated building sited over the existing chemical bund on a suspended concrete deck at road level. The building would house all electrical and control components apart from a new pole-mounted transformer and a skid-mounted generator. The existing building would be demolished and reforming earthworks undertaken.

With respect to 2011/12

Notwithstanding that the expenditure in the 2011/12 financial year is not within the scope of this review approximately half of the capital expenditure programmed for the 2011/12 financial year is not related to the chlorine control building, as shown below in **Table 112**.

Table 112 Breakdown of 2011/12 costs

Item		2011/12 cost ($)
1	Chemical building options study	29,500
2	Ammonia storage leak detection	40,528
3	Remote actuation of Cameron Hill Reservoir 1 & 2 inlet, outlet and cross-connection valves (6 number)	43,358
4	Install Rotork Actuator on Cameron Hill Reservoir 1 inlet valve	65,000
5	Cameron Hill Reservoir 1 outlet valve refurbishment and actuator replacement	131,000
Sub-Total		**309,386**
Chlorine control building foundation repairs		300,000
Sub-Total		**609,386**

7.18.3. Provided documentation

The key reference documents used for this review are:

- *Holts Hill Chemical Building Replacement Upgrade Business Case*, Version 4.2, Seqwater December 2011
- Holts Hill Gauge House Report on Geotechnical Appraisal of Subsidence, GHD, June 2009
- *Slope Stability Review – Holts Hill, Mount Crosby*, WorleyParsons, September 2009
- *Slope Stabilisation at Holts Hill – Concept Design and Cost Estimate*, WorleyParsons, August 2010
- *Risk Review of Holt Hills Relocated Chemical Building – Exposure to Ammonia*, Seqwater, no date
- *Remote Actuation of valves*, Seqwater, no date
- *Cameron Hill1 Inlet Valve Actuator Replacement*, Seqwater, no date
- *Holts Hill Anhydrous Ammonia Leak Detection System*, Seqwater, no date
- *Cameron Hill Refurbishment of reservoir 1 outlet valve*, Seqwater, no date

7.18.4. Prudency

Cost driver

The cost driver nominated by Seqwater for this project is *service.*

Multiple investigations have been conducted over a period of years (Brisbane City Council in 2002, GHD in 2009 and Worley Parsons in 2010) with the consistent recommendation that the chemical building should either be relocated to a safer site at Holts Hill or retained with stabilisation and remediation of the slope and building.

Under the Water Supply (Safety and Reliability) Act 2008 Seqwater is obliged to provide a reliable and safe drinking supply. The Holts Hill Chemical Building is an integral part of the process for supply of potable water to the grid from the Mt Crosby Water Treatment Plants via the Cameron Hill Reservoirs. Seqwater is obliged to take reasonable steps to ensure the continuity of supply in accordance with this obligation and its contractual requirements to the SEQ Water Grid Manager to make treated water available.

With respect to 2011/12

The 2011/12 items are mainly driven by *renewal* and, in the case of the ammonia storage leak detection, *compliance*. The drivers for the other 2011/12 works would be as outlined below in **Table 113**.

- **Table 113 2011/12 project drivers**

Item		Compliance ($000s)	Service ($000s)	Renewal ($000s)
1	Chemical building options study	29	-	-
2	Ammonia storage leak detection	41	-	-
3	Remote actuation of Cameron Hill Reservoir 1 & 2 inlet, outlet and cross-connection valves (6 number)	-	43	-
4	Install Rotork Actuator on Cameron Hill Reservoir 1 inlet valve	-	65	-
5	Cameron Hill Reservoir 1 outlet valve refurbishment and actuator replacement	-	-	131
Chlorine control building foundation repairs		-	300	-
Total		**70**	**408**	**131**

The above table illustrates that *service* is the dominate driver.

Given this information, *service* is considered an acceptable cost driver for this project.

Decision making process

With respect to 2012/13

A range of six options were developed for the existing site and for three alternative sites identified by Seqwater:

- Option 1 – modify existing building and site to stabilise slope and meet applicable standards
- Option 2 – new building over the chemical bund area
- Option 3 – new building at the former Filter Nine site
- Option 4 – process testing and analysers adjacent to the Camerons Hills Reservoirs with switchboards and control systems in cabinets at the dosing area
- Option 5 – new analyser building located near pipeline dosing plant with new switchroom at chemical bund area
- Option 6 – on-line analysers at the Cameron Hill mains with all other items located as in Option 3

Criteria and weightings were developed and the options were scored against these in order to select options for initial costing. Options 1 and 5 were eliminated due to unacceptable supply reliability and workplace health and safety risks.

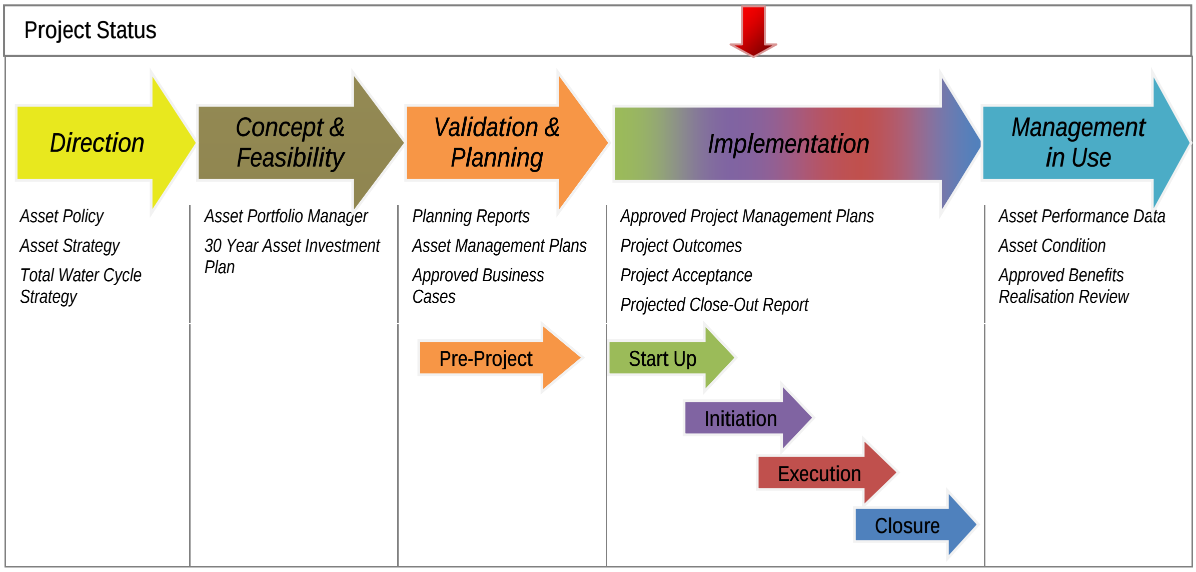
Initial cost estimates were used to calculate the NPV for the shortlisted options over a 20 year period. The preferred option (Option 2) has the lowest capital cost and NPV and also meets Seqwater's other requirements. Furthermore, there are not likely to be unforeseen geotechnical issues due to its location.

Mt Crosby Eastbank Water Treatment Plant has been identified by Seqwater as a criticality five facility which means it is essential for the supply of the water base load to the SEQ Water Grid. Supply to Greater Brisbane, Ipswich and associated regions is dependent on the Holts Hill facilities. If the chemical building were damaged or destroyed by a landslip then final dosing of water to and from Camerons Hill could not be carried out with the potential for loss of residual disinfection to consumers and failure to meet regulated bacterial standards. Hence, it is considered a 'do nothing' option would not mitigate the risk of not meeting the regulatory requirements.

The project has been assessed as prudent. The primary driver of *service* has been demonstrated. An acceptable decision making process has been documented.

7.18.5. Efficiency

The estimate of the project status is included below.



The scope of works

The scope of work proposed in Option 2, construction of a new building over the chemical bund area, is consistent with the recommendations from the independent 2009 and 2010 investigations carried out by GHD and Worley Parsons. The Brisbane City Council investigation in 2002 did recommend that the building should be underpinned and the voids grouted however the GHD report noted that health and safety risks during construction could preclude the use of pile rigs to rehabilitate the existing building.

With respect to 2012/13

Some existing equipment will be re-used and some replaced. A clear scope detailing precisely what is to be replaced has not been provided. Seqwater's business case states that:

- The control PLCs which are nearing the end of their life will be replaced
- The new back up power supply will be capable of operating the whole Holts Hill facility whereas the current supply is insufficient to run the whole site

In a meeting Seqwater clarified these two points:

- The Holts Hill facility cannot be taken offline, even during periods of low demand. Hence replacement rather than relocation of some equipment is necessary so that the new equipment can be installed and commissioned while the existing equipment is still operational
- Recent construction of the fluoridation facility exceeded the capacity of the existing plant back up power supply. The new back up supply will be sized to operate the whole Holts Hill facility once more (providing n-1 power supply redundancy)

The scope of works for the chlorine control building project is considered appropriate.

With respect to 2011/12

Insufficient information has been provided on the valve refurbishment and actuation works for 2011/12.

Standards of works

Seqwater is using industry standards as a minimum standard while it is in the process of amalgamating the standards of the various legacy donor councils. It is generally intending to replicate the existing chlorine control building functionality with some redundancy to reflect the criticality of the Holts Hill facility.

A risk review was conducted to check compatibility of the proposed option with the existing adjacent infrastructure, particularly the fluoride building, anhydrous ammonia storage cylinder, aqueous ammonia batching and dosing system and the hypochlorite storage and dosing system. The strategy for the risk review was to verify compliance with the Australian Standards, then to assess the risk in comparison with the risk that the organisation currently tolerates for staff accessing the existing chemical and fluoride buildings. This review concluded that the location for the new chemical building is considered to pose a lower risk to operators in terms of exposure to ammonia than the current building.

Project cost

The chlorine control building business case provided by Seqwater provided a breakdown of the project budget based on a cost estimate by an external advisor. A request for this information was made but as at 25/03/2012 neither the name of the external advisor or the report had been received.

The business case recommends that activities undertaken in the 2011/12 financial year be limited to budgetary arrangements, engaging the designer, design and calling tenders for construction work, ready for award early in the 2012/13 financial year. The 2011/12 budget includes $ 300,000 for their 2011/12 activities.

The documentation provided on the valve refurbishment and actuation gives only budget estimates which do not exactly correspond with the breakdown of the 2011/12 submission to the Authority as detailed in **Table 112**. For example, a cost of $ 43,358 was provided by Seqwater in **Table 112** for the remote actuation of the six Cameron Hill Reservoir inlet, outlet and cross-connection valves but the budget estimate also provided by Seqwater lists a value of $ 55,000.

Ammonia leakage detection is allocated $ 40,528 in **Table 112** but $ 46,000 in the budget estimate provided by Seqwater. A September 2011 quote from J & P Richardson Industries Pty Ltd gives the price for supply and installation of the detection system as $ 30,480.

With respect to 2012/13

The business case details a construction budget as detailed in **Table 114**.

- **Table 114 Breakdown of construction costs**

Component	Base Cost ($000s)	Contingency (%)	Total Cost ($000s)
Project Costs	254	0	254
Earthworks	252	50	378
Power	553	30	719
Control System	154	30	201
Building Works	207	30	269
Process	102	30	133
Total	1,523	28	1,954

The method for calculating construction costs is detailed in the business case, the unit rates provided appear reasonable. It is understood that Seqwater are going to market in the form of design then construct contracts, hence project costs will reflect current market conditions.

7.18.6. Policy and procedures

The chlorine control building project follows Seqwater's standard procedures, including the production of a project business case.

The inclusion of other works does not follow procedure whilst the works appear valid and are proximal to Holts Hill they have not been included in the Business Case.

As per Seqwater's procurement procedure, items of capital expenditure with a nominal contract value greater than $100,000 require a tender process. As the Holts Hill Chlorine Control Building has an expected capital expenditure of $1.954 million it should be subject to this method of procurement. The decision on whether the tender will be an open or closed tender must be reviewed and approved by an Executive General Manager.

No evidence of competitive pricing has been provided for any of the 2011/12 works.

7.18.7. Timing and deliverability

Seqwater has considered the advantages and disadvantages of various procurement and delivery methods and has concluded that the project should be undertaken as detailed design and then construction for the following reasons:

- Seqwater's specific scope and preferred equipment can be more readily incorporated
- There is little scope for the innovation that design and construction contracts can deliver as Seqwater has very specific requirements
- Seqwater views that the opportunity to maximise its input and knowledge through the design stage is a key advantage
- The upgraded plant will be a combination of existing and new equipment and under a design and construct contract design liability would hence be unclear due to the performance of components being interrelated

Seqwater intends that construction commences in August 2012, on the proviso that all design work has been completed. Practical completion would then be attained in June 2013. Seqwater verbally confirmed that it is confident the project will be completed in the 2012/13 financial year.

Demolition of the current building, re-profiling of the slope and avoiding existing buried assets are all complex aspects of the project which will also be very sensitive to wet weather and possibly restrained by other requirements necessary to complete the work safely. This has been acknowledged by Seqwater in preparation of the cost estimates but it is not known if the proposed programme also allows for these risk elements.

7.18.8. Efficiency gains

Seqwater considers that it is unlikely that there will be any significant direct change to operational and maintenance costs as a result of this project. There is an indirect financial and environmental benefit associated with the reduced risk of catastrophic failure of the slope below the current chemical building.

7.18.9. Allocation of overhead costs

$ 127,000 or approximately 6% has been allowed for design costs and $ 127,000 or approximately 6% for project management costs. Contingency of 30% of capital cost items has been included, except for earthworks which includes a 50% contingency due to uncertain ground conditions.

These contingency costs are unreasonably high based on the stage of the project and the solution being to move the structure to competent ground.

7.18.10. Summary

The chlorine control building project is assessed as prudent. The primary driver of *service* has been demonstrated and an acceptable decision making process has been documented.

The 2012/13 budget project is assessed as efficient as the scope is appropriate, the proposed standards of works are consistent with industry practice and the costs will be market tested by the tender process.

The 2011/12 renewals work (valve actuation and refurbishment) has not been assessed as prudent as insufficient information documenting the decision making process has been provided.

The anhydrous ammonia leak detection system has been assessed as prudent. The primary driver of *compliance* has been demonstrated, however insufficient information has been provided to complete an efficiency assessment.

The appraisal of the 2011/12 budget is not part of the scope of this review.

The value of 2012/13 expenditure not considered to be prudent and efficient: Nil.

It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information should include:

- Details of any independent cost reviews
- Options studies or assessments for the valve actuation and refurbishment work, including consideration of alternatives such as spindle extensions
- Justification of the need for the 2011/12 works, for example NPV analysis showing that remote actuation of the valves is justified by savings in confined space entry despite the low frequency of their use and the need to enter the confined space to maintain the actuators
- Approved business cases for all the 2011/12 works
- Evidence of competitive pricing of the 2011/12 works, for example evidence that alternative ammonia detection systems were considered

The adequacy of the information provided on this project is outlined below in **Table 115**.

- **Table 115 Adequacy of information provided**

Section of Capex review	Holts Hill Chlorine Control Building foundation repairs
Project description	
Provided documentation	
Prudency	
Cost driver	
Decision making process	
Efficiency	
Scope of works	
Standards of work	
Project cost	
Policy and procedures	
Timing and deliverability	
Efficiency gains	
Allocation of overhead costs	

Section of Capex review	Holts Hill Chlorine Control Building foundation repairs		
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

7.19. Beaudesert Water Treatment Plant Upgrade Works

7.19.1. Proposed capital expenditure

Table 116 shows the proposed cost of the Beaudesert Water Treatment Plant upgrade works within the 2012/13 to 2014/15 budgets.

- **Table 116 Beaudesert Water Treatment Plant upgrade works – proposed capital expenditure profile**

Source	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
A8 2012-2013 GSC Information Return Capex 2012-13.xlsm	-	2,500	4,500	2,000	-	9,000

7.19.2. Project description

No information other than the *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm* (Seqwater, February 2012) spreadsheet provided as part of Seqwater's initial submission has been provided. The below project description has be gathered from available industry information.

The Beaudesert WTP is a conventional treatment plant capable of treating 3.75 ML/d of drinking water per day at a nominal flow rate of 52 L/s. The plant consists of an aerator, upflow clarifier, pressure filters and chlorine disinfection and storage.

Water is sourced from the Logan River via a pump well mounted in the river, some 1.5 km away from the plant. The current intake, situated at the Beaudesert Weir, does not operate when the river is fast flowing due to the type of screens that are in place. The catchment is highly compromised with heavy industry and sewage treatment upstream and in close proximity to the off-take. Being a live river system, the turbidity peaks to very high levels during rain events. Subsequently, improvements are needed to the plant to improve water quality surety.

The investment plan to increase capacity and / or to upgrade the plant will take into account Grid demand projections to ensure investment efficiency is achieved. It is expected that demand will surpass capacity in 2017 and that MDMM will be 11 ML/d in 2031. It is also expected that an upgrade to the plant would be required in or before 2014.

7.19.3. Provided documentation

The key reference documents used for this review are:

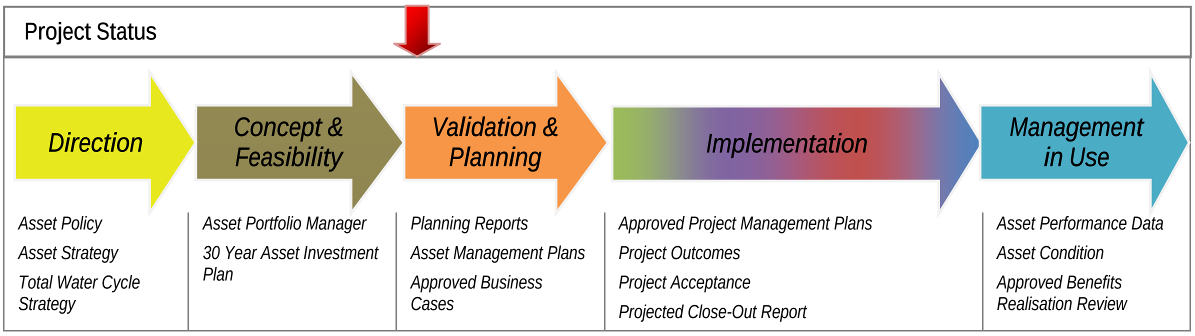
- *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm*, Seqwater, February 2012

Other reference documents used for this review are:

- *Consultancy Brief: Scenic Rim Water Treatment Plants – Preliminary Design Development*, Rev 2, Seqwater, August 2011

7.19.4. Prudency

The estimate of the project status is included below.



Cost driver

The cost driver nominated by Seqwater for this project is *growth*.

At this stage SKM is unable to establish whether this driver is appropriate, as the need for and the scope of the project is yet to be documented and forwarded. An options study is currently being undertaken to determine the most appropriate approach for Beaudesert Water Treatment Plant. The options study was due for completion in February 2012.

Decision making process

Seqwater has engaged an external consultant (Hunter Water Australia) to undertake a study to determine what options are available for the future of the Beaudesert Water Treatment Plant.

The prudency of the total investment is yet to be established, however it is prudent to complete the options assessment in order to determine the most appropriate path forward. An appropriate decision making process has been documented to date, including the commissioning of a comprehensive options study.

7.19.5. Efficiency

The project is not at a stage where the scope, cost and standards have been determined. Consequently assessment of the efficiency cannot be commenced.

7.19.6. Policy and procedures

Relative to the project progress to date the policy and procedures appear to comply with Seqwater's policies and procedures.

7.19.7. Timing and deliverability

The project is in the early stages and the preliminary design was due to be completed in February 2011 but is not on schedule. Subsequent to the options analysis a business case will need to be prepared and approved, followed by a sourcing strategy; implementation schedule and outline of deliverables. The likelihood of expending $ 2.5 million before June 2013 is improbable.

7.19.8. Efficiency gains

The project is not at a stage where an assessment of the efficiency can be commenced.

7.19.9. Allocation of overhead costs

The project is not at a stage where costs and therefore overhead costs can be determined.

7.19.10. Summary

The prudency of this project is yet to be established, however it is prudent to complete the options assessment in order to determine the most appropriate path forward. An appropriate decision making process has been documented to date, including the commissioning of a comprehensive options study.

Efficiency has not been assessed as prudency is yet to be established.

The value of expenditure considered to be prudent and efficient is outlined below in **Table 117**.

- **Table 117 Beaudesert Water Treatment Plant Upgrade - revised capital expenditure profile**

Project	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
Beaudesert Water Treatment Plant Upgrade	0	0	0	0	0	0

It is noted that there will be expenditure on project delivery tasks in 2011/12 and 2012/13, however at this stage we are not able to determine this. When the options study is completed a budget should be approved by Seqwater.

It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information should include:

- Confirmation of the cost driver
- Needs analysis
- Options analysis, including scope, costs and timeframes

The adequacy of the information provided on this project is outlined below in **Table 118**.

Table 118 Adequacy of information provided

Section of Capex review	Beaudesert Water Treatment Plant Upgrade		
Project description			
Provided documentation			
Prudency			
Cost driver			
Decision making process			
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

7.20. Boonah Kalbar Water Treatment Plant – Plant Automation/Pipeline Upgrade

7.20.1. Proposed capital expenditure

Table 119 shows the proposed cost of the Boonah Kalbar Water Treatment Plant – Automation/Pipeline Upgrade within the 2011/13 to 2014/15 budgets.

Table 119 Boonah Kalbar Water Treatment Plant – Automation/Pipeline Upgrade – Proposed capital expenditure profile

Source	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
A8 2012-2013 GSC Information Return Capex 2012-13.xlsm	300	2,500	1,500	5,000	-	9,300
Business Case	100	3,450	2,889	-	-	6,448

The information provided in the business case is not consistent with the costs within Seqwater's submission to the Authority.

It should be noted SKM were the consultants commissioned for the *Boonah Kalbar WTP: Long-term Planning and Options Study*. To avoid a conflict of interest in the review of this project the staff utilised were generally not involved in the original work and there was no communication with staff involved in the work.

7.20.2. Project description

The Kalbar Water Treatment Plant was built in 1985 and is a basic conventional treatment plant capable of treating 4 ML/d of drinking water per day at a maximum flow rate of 45 L/s. Raw water is released from Moogerah Dam into Reynolds Creek where it is extracted for treatment 9 km downstream. The potable water is supplied to Queensland Urban Utilities who distribute the water to the townships of Boonah, Kalbar, Aratula and Mount Alford. The plant is manually operated on an 8 to 10 hour shift to meet current demands.

Seqwater commissioned planning study (SKM, 2010) which identified several issues with Kalbar Water Treatment Plant's ability to comply with contractual and legislated requirements in terms of water quality and quantity, in the short and long term. These include:

- The current water extraction location is unreliable and failed during the millennium drought and has poor water quality due to upstream agricultural activities
- Sludge management system is insufficient to meet future regulatory and contractual obligations
- The current manual operational regime is nearing the current demand needing additional out of hours manual operation or plant automation
- The current plant production capacity will not meet projected peak demand from 2019

The work to be completed as part of this project includes:

- Project 1 - New raw water pump station at The Gorge and new pipeline delivering raw water to the existing Kalbar water treatment plant
- Project 2 - Control system improvements to allow unmanned operation with caustic dosing system and chemical dosing upgrade
- Project 3 - Improvements to the sludge treatment facilities

7.20.3. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm*, Seqwater, February 2012
- *Business Case: Kalbar WTP Long Term Planning and Options*, Seqwater, February 2012
- *Boonah-Kalbar WTP: Long Term Planning and Options Study*, SKM, November 2011

7.20.4. Prudency

Cost driver

The nominated cost driver by Seqwater for this project is compliance.

For Project 1, the cost driver is supported by the *Business Case: Kalbar WTP Long Term Planning and Options* (Seqwater, February 2012) which included below in **Table 120**.

▪ **Table 120 Seqwater identified cost drivers by category**

Project Drivers	Nature of the Drivers	Explanation of Identified need
Contractual compliance	Seqwater is contractually obliged (Grid Contract) to supply the Water Grid with a safe and reliable source of drinking water.	The current raw water extraction point has the following two constraints in terms of Seqwater's ability to comply: Low reliability - reliability of the run-of-river supply is at risk with estimated losses of up to 40% from Moogerah Dam to the current off-take site (Gough's Crossing) during dry weather periods. The millennium drought highlighted this when water released from Moogerah Dam did not reach the pumping pool. Supply was then supplemented from other sources. Raw water quality - Both upstream and downstream of the extraction point are substantial areas of agricultural and pastoral activities. These activities have been identified as high risks to water quality (HACCP, 2011). They compromise the raw water quality through the introduction of pathogens and additional sediment loads. These needs were formally identified via a Seqwater commissioned planning study (SKM, 2010) **According to treated water quality presented in an options study (SKM, 2011) exceedances of the ADWG guidelines for 2-MIBs and Manganese have been detected**
Regulatory compliance	As a drinking water service provider, Seqwater is obligated to provide drinking water which meets conditions within the following acts: ▪ Water Act 2000 ▪ Water Supply (Safety and Reliability) Act 2008 ▪ Public Health Act 2005 (amendment).	
Regulatory compliance	Seqwater's investment in optimising sludge management will ensure the plant's ability to meet ADWG and reduce the risk of environmental impacts which would result in penalties under the following acts: ▪ Environment Protection Act 1994 ▪ Environment Protection Regulation 2008 ▪ Environment Protection (Waste Management) Regulation 2000 ▪ Waste Reduction and Recycling Bill and Regulation	The poor state of the sludge management systems, including the inability of the sludge lagoons to contain supernatant during high inflow events, increases the risk of Seqwater not meeting its regulatory obligations for environmental protection. This need was identified through a planning study (SKM, 2010), the Water Treatment Sludge Handling Report (Aecom, 2011), and Seqwater Sludge Management Strategy (HWA, 2011).
Contractual compliance/ Demand growth	Projected growth indicates that current operational protocols will be unable to meet forecast production requirements. Grid Contract	The demand will exceed plant capacity in two stages: Short term – when demand exceeds the capacity based on the current 8-10 hour manned operation of the plant ~2013/14 Medium term – when demand exceeds the capacity of the plant even when operating full time ~2019 Planning Study (SKM, 2010).
Renewals	A number of assets have been noted as nearing the end of their useful lives through condition assessment undertaken as part of this project, or through previous studies.	Assets identified include: Raw water intakes, Soda ash facility, Sludge recovery pumps and Sludge lagoons. In particular, condition assessment reports have shown the need for renewal of the existing raw water infrastructure.

Source: *Business Case: Kalbar WTP Long Term Planning and Options* (Seqwater, February 2012)

From this is can be seen that although Seqwater have identified a number of cost drivers that the project relates to, compliance is the most prominent.

Decision making process

An options analysis was completed for Project 1, including a 'business as usual' option. The *Boonah-Kalbar WTP: Long Term Planning and Options Study* (SKM, November 2011) included an assessment of a number of options. These were:

- Option 1 – Business as usual
- Option 2 – Business as usual, improve pathogen barrier and build a new plant when required
- Option 3 – Relocate intake to gorge, improve pathogen barrier and expand the Boonah–Kalbar Water Treatment Plant
- Option 4 – Improve raw water quality and reliability at existing water treatment plant site
- Option 5 – Interim improvements to Boonah–Kalbar Water Treatment Plant and staged relocation of water treatment plant to Moogerah
- Option 6 – Connection to SEQ Water Grid

These options were assessed on technical viability, ability to meet the identified needs, the timeliness of delivery and cost effectiveness, as outlined below in **Table 121**.

- **Table 121 Options assessment**

Option	Technical viable	Meets identifies needs	Timeliness of delivery	Cost effectiveness
Option 1 – Business as usual	Yes	No	Not assessed	Not assessed
Option 2 – Business as usual, improve pathogen barrier and build a new plant when required	Yes	No	Not assessed	Not assessed
Option 3 – Relocate intake to gorge, improve pathogen barrier and expand the Boonah–Kalbar WTP	Yes	Yes	Can be constructed within necessary timeframes	Estimated capital cost of $15-25M
Option 4 – Improve raw water quality and reliability at existing WTP site	Yes	No	Not assessed	Not assessed
Option 5 – Staged relocation of WTP to Moogerah	Yes	Yes	Can be constructed within necessary timeframes	Estimated capital cost of $35-50M
Option 6 – Connection to SEQ Water Grid	Yes	No	Not assessed	Not assessed

Source: *Boonah-Kalbar WTP: Long Term Planning and Options Study* (SKM, November 2011)

From this assessment the two preferred options selected for more detailed assessment were:

- Option 3 – Relocate intake to gorge, improve pathogen barrier and expand the Boonah–Kalbar Water Treatment Plant
- Option 5 – Interim improvements to Boonah–Kalbar Water Treatment Plant and staged relocation of water treatment plant to Moogerah

The timing of delivery of each of the options is outlined below in **Table 122**.

- **Table 122 Timing of the two options**

Option	WTP	Stage 1 (2012-2015)	Stage 2 2019	Stage 3 2032	Future 2041+
Option 3	Boonah–Kalbar	Change Raw water Intake to the Gorge	Upgrade and improve the plant to a capacity of 111 L/s to meet requirements up to 2031		Upgrade or construct a new plant to meet requirements for 2050
Option 5	Boonah–Kalbar	Improve/ complement the plant to maintain a capacity of 55 L/s to 2032		Decommission	
	Moogerah		Construct a plant to a capacity of 29 L/s and pipeline to Kalbar	Upgrade to 111 L/s to meet requirements up to 2041	Upgrade to meet requirements for 2050

Source: *Boonah-Kalbar WTP: Long Term Planning and Options Study* (SKM, November 2011)

A comparison of the capital costs, operating costs and net present value (NPV) for the two selected options are presented below in **Table 123**. SKM state that the estimates were determined based on SKM internal cost databases, available industry data and quotations received for similar components where possible. The *Boonah-Kalbar WTP: Long Term Planning and Options Study* (SKM, November 2011) states that the capital costs include a 25% contingency at each stage, and have an accuracy of accuracy of ± 30% and that the NPV used 2011 as the base year, a discount rate of 7% and was calculated over 30 years to 2014.

- **Table 123 Evaluation of options**

Option	Option 3 – Relocate raw water intake to the gorge	Option 5 – Staged relocation of WTP to Lake Moogerah
Capital cost estimate ($)	15,051,000	45,405,000
Operating costs at 2041 (per year, 2011 dollars)	298,200	364,400
Net present value	13,040,000	27,017,000

Source: *Boonah-Kalbar WTP: Long Term Planning and Options Study* (SKM, November 2011)

The relocation of the raw water pump station to the Gorge is supported by the following statement in the *Boonah-Kalbar WTP: Long Term Planning and Options Study* (SKM, November 2011):

> *"The raw water quality in Reynolds Creek, particularly between Purdon's Bridge and Gough's Crossing, where the current raw water intake in located, deteriorates, primarily pathogen contamination, due to the land use adjacent to the creek"*

The *Boonah-Kalbar WTP: Long Term Planning and Options Study* (SKM, November 2011) further states that the raw water quality may be improved by relocating the intake pump station upstream and presents a comparison between the raw water quality as monitored at the Lake Moogerah Water Treatment Plant, as a proxy for the Gorge, and at the Boonah–Kalbar Water Treatment Plant, as presented below in **Table 124**.

Table 124 Raw water quality for Boonah–Kalbar and Moogerah (Samples, 2009-2011)

Parameter	Unit	Location	Average	95th percentile
Turbidity	NTU	Boonah–Kalbar	12.5	45
		Moogerah	4.6	16.75
True colour	HU	Boonah–Kalbar	39	110
		Moogerah	26.3	67
Manganese (total)	mg/L	Boonah–Kalbar	0.11	0.21
		Moogerah	0.04	0.08
DOC	mg/L	Boonah–Kalbar	3	7.9
		Moogerah	5.8	7.6
E.coli	MPN/100 mL	Boonah–Kalbar	656	712
		Moogerah	8.5	430
MIB1	ng/L	Boonah–Kalbar	9/2/10 – 29	
			9/3/10 – 9.7	
		Moogerah	9/2/10 – 8.7	
			9/3/10 – 12	
Geosmi1	ng/L	Boonah–Kalbar	9/2/10 – 7.7	
			9/3/10 – 2.7	
		Moogerah	9/2/10 – 2.3	
			9/3/10 – <2	

Notes: 1. Event based monitoring
Source: *Boonah-Kalbar WTP: Long Term Planning and Options Study*, SKM, November 2011

It can be seen from **Table 124** that Moogerah is a superior raw water source, when compared to the Boonah–Kalbar source, with regard to turbidity, colour, manganese, E. Coli and taste and odour compounds.

The preferred option from the *Boonah-Kalbar WTP: Long Term Planning and Options Study* (SKM, November 2011) Option 3 – Relocation of the intake to the gorge, improve the pathogen barrier and expansion of treatment capacity as required as it has the lowest capital and operating costs, lowest NPV and non-cost attributes.

For Project 2 the business case states that *"the scope has been developed using Scope of Works, Kalbar WTP Dosing Pump Upgrade (July 2011) as a basis. This has been refined based on discussions with Water Delivery and Project Delivery Early works program. Preliminary details of the scope are provided in Appendix X which also provides a cost breakdown. The detailed scope will be developed as part of the implementation phase."* This documentation has not been provided.

However, the *Boonah-Kalbar WTP: Long Term Planning and Options Study* (SKM, November 2011) identifies that currently the Boonah–Kalbar Water Treatment Plant is only required to operate 8 to 10 hrs/workday to meet actual demand. For the plant to operate at its theoretical current treatment capacity, approximately 3.96 ML/d based on an operational period of 20 hrs/d, automation of the plant is required to enable reliable operation when not attended.

The *Boonah-Kalbar WTP: Long Term Planning and Options Study* (SKM, November 2011) states:

> *"Population in the towns currently served by Boonah–Kalbar WTP is forecast to increase from 4.767 in 2011, to 12,395 in 2041. Consequently the mean day maximum month (MDMM) demand will also increase to 7.0 ML/day. The current treatment capacity at Boonah–Kalbar WTP (3.96 ML/d) will be required to be increased by 2019 to provide sufficient treatment capacity to meet MDMM demands."*

No options assessment was presented for review.

For Project 3 the business case states that *"A project is currently underway to better define the preliminary design and cost estimate. The scope of this project can be found in Project Brief - Kalbah, Kooralbyn and Rathdowney WTPs Solids Handling Facility Upgrade. Options Study and Preliminary Design of Solids Handling Facilities."* This documentation has not been provided. The business case also states that *"Further investigations will be required to refine the scope suitable for detailed design, and implementation"*.

The *Boonah-Kalbar WTP: Long Term Planning and Options Study* (SKM, November 2011) states:

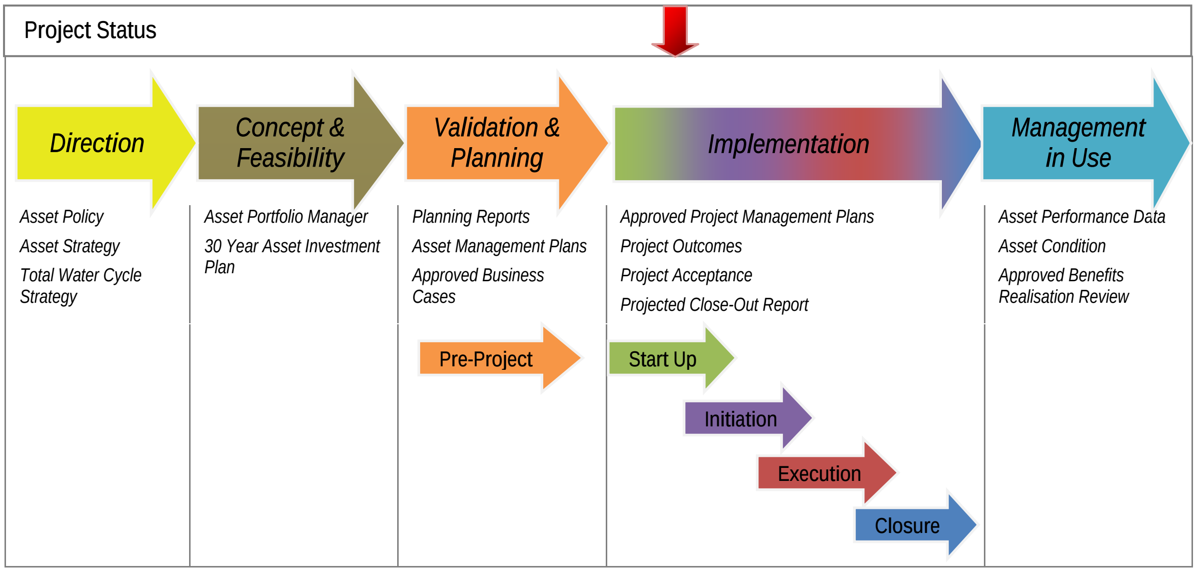
> *"The Seqwater Sludge Management Strategy (draft 2011) identified that the sludge handling system at Kalbar WTP is insufficient to meet current and future sludge management and environmental requirements. The sludge management system consists of three sludge lagoons which receive clarifier sludge and filter backwash directly without a backwash recovery tank and thickening process. The lagoons are filled in sequence. Once one is full the next is filled (note lagoon 3 is currently not in operation). Once the sludge has thickened, the supernatant is returned to the head of the process which can release unwanted manganese where high manganese can result. Sludge lagoons require cleaning once per year where sludge is pumped out and trucked offsite at a cost of $10,000 per year.*
>
> *The sludge lagoons provide sufficient storage under normal conditions (Aecom, 2011). However, they overflow to adjoining land in high inflow events, creating an environmental issue (HWA, 2011). The design of the lagoons do not provide sufficient thickening, rendering the haulage operations more costly as a high content of water is hauled. The Sludge Management Strategy and Water Treatment Sludge Handling Report (2011) recommended an upgrade of the sludge management systems including upgrading the current lagoons and treating for manganese prior to feeding supernatant back into the WTP."*

An appropriate decision making process has not been documented for Project 3, however as a project is currently underway to better define the preliminary design and cost estimate this is acceptable.

Project 1 has been assessed as prudent. The primary driver of compliance has been demonstrated and an appropriate decision making process has been documented. Projects 2 and 3 are assessed as prudent.

7.20.5. Efficiency

The estimate of the project status is included below.



The scope of works

The scope of works for this project, as outlined in the *Business Case: Kalbar WTP Long Term Planning and Options* (Seqwater, February 2012) is:

Project 1	Install new raw water intake at The Gorge, and construct a pump station and raw water pipeline to the existing Kalbar Water Treatment Plant
Project 2	Improvements to the instrumentation, dosing equipment and control systems to allow the plant to be operated unmanned in a reliable manner incorporating chemical dosing system upgrades as well as a new caustic dosing facility to replace the soda ash system
Project 3	Improvements to the sludge treatment system

The scope of Project 1 includes:

> *"The scope includes design, supply, installation and commissioning of:*
>
> - *Construction of a new raw water pump station at Gorges crossing and a pipeline from the gorge to Kalbar WTP. According to a preliminary design report by SKM, 2012, it will involve:*
>
>   ***Pump Station – 57 kW***
>   - *Earthworks*
>   - *Civil*
>   - *Electrical*
>   - *Telemetry*
>   - *Weir*
>
>   ***Pipeline***
>   - *Supply Pipe - 355mm OD, PE100 PN16*

- *Section Valves*
- *Air Valves*
- *Scour Valves*
- *Pre-rip Plough*
- *Plough 355mm OD Pipe*
- *Butt Welding*
- *Horizontal Directional Drilling*
- *Associated SCADA, mechanical and electrical control systems integrated with existing system.*
- *HAZOPS as required*
- *Operating manual and operator training"*

The *Constraints and Cost Assessment for Raw Water Pipeline – the Gorge to Kalbar WTP* (SKM, 2012) provides details of the preliminary design, including pipe route and cost estimate details. This document has not been provided.

The scope of Project 2 includes:

> *"The scope includes design, supply, installation and commissioning of:*
>
> - *Alum Dosing System capacity and automation upgrade*
> - *Hypo System capacity and automation upgrade*
> - *New Caustic System - automated*
> - *Chemical Unloading Area*
> - *Field Equipment and Instrumentation to allow automation eg of filter backwash system*
> - *Hazop and risk assessment work shops*
> - *Control System Programming and alarming*
> - *Commissioning and Handover"*

The business case states that *"the scope has been developed using Scope of Works, Kalbar WTP Dosing Pump Upgrade (July 2011) as a basis. This has been refined based on discussions with Water Delivery and Project Delivery Early works program. Preliminary details of the scope are provided in Appendix X which also provides a cost breakdown. The detailed scope will be developed as part of the implementation phase."* This documentation has not been provided.

The scope of Project 3 includes:

> *"The design of the sludge system improvements are not as well advanced as that of the two scopes above. Further investigations will be required to refine the scope suitable for detailed design, and implementation of at least the following:*
>
> - *Prevention of unlicensed environmental discharges*

- *Optimisation of existing sludge storage system*
- *Investigation of pre-thickening of sludge before the existing lagoon system*
- *Improvements to access for periodic de-sludging*
- *Site security to improve public safety*
- *Improvement to minimise storm water ingress*
- *Piping and valves*
- *Supernatant Management Improvement"*

The business case states that *"A project is currently underway to better define the preliminary design and cost estimate. The scope of this project can be found in Project Brief - Kalbah, Kooralbyn and Rathdowney WTPs Solids Handling Facility Upgrade. Options Study and Preliminary Design of Solids Handling Facilities."* This documentation has not been provided.

The scope of Project 1 is assessed are appropriate. There is insufficient information to assess the scope of Projects 2 and 3 as appropriate.

Standards of works

No information has been provided on the standard of works that the project will conform to. It is however expected that the works will be required to conform to technical, design and construction legislative requirements.

Project cost

The *Business Case: Kalbar WTP Long Term Planning and Options* (Seqwater, February 2012) includes an estimate of the costs for each of the projects, as outlined below in **Table 125**, **Table 126** and **Table 127**. The costs were estimated based on similar sized projects carried out in SEQ (with Rawlins construction cost index applied), SKMs internal cost database, industry data and quotations for similar components. The estimates include a 20% contingency for Project 1 and 25% for Projects 2 and 3 and have an accuracy of ± 30%.

- **Table 125 Cost breakdown for Project 1**

Item	Description		Cost Estimate ($)
1	**Pipeline**		
1.1		Supply Pipe - 355mm OD, PE100 PN16	1,190,750
1.2		Section valves	100,000
1.3		Air valves	90,000
1.4		Scour valves	65,000
1.5		Pre-rip plough	23,595
1.6		Plough 355mm OD pipe	850,000
1.7		Butt Welding	12,500
1.8		Horizontal directional drilling	450,000
		Sub-Total	**2,782,000**
2	**Pump Station**		

Item	Description		Cost Estimate ($)
2.1		Earthworks	14,000
2.2		Civil	216,000
2.3		Electrical	173,000
2.4		Telemetry	100,000
2.5		Weir	75,000
		Sub-Total	**578,000**
3	**Site Works**		
3.1		Regrade & restoration of the route	104,940
3.2		Reinstate fences	22,500
3.3		Access roads	10,000
		Sub-Total	**137,500**
4	**Finalisation**		
4.1		Testing and construction drawings	$75,000
5	**Implementation**		
5.1		Geotechnical Investigation	25,000
5.2		Regulatory approvals and environmental investigations	14,186
5.3		Survey	15,000
5.4		Design & construct documentation	166,890
5.5		Supervision and contract administration	83,445
		Sub Total	**304,500**
6	**Project management**		
6.1		Project Management - Pipeline & Pump	500,000
		Sub Total	**4,380,791**
7	**Contingency**		
7.1		Contingency (20%)	877,000
TOTAL			**5,258,000**

Source: *Business Case: Kalbar WTP Long Term Planning and Options* (Seqwater, February 2012)

- **Table 126 Cost breakdown for Project 2**

Item	Description		Cost Estimate ($)
1	**Design**		
1.1		Design (including HAZOP and risk analysis)	110,000
2	**Supply and installation**		
2.1		Alum Dosing System automation and capacity upgrade	45,000
2.2		Hypo System automation and capacity upgrade	33,000
2.3		New Caustic System automated	105,000
2.4		Chemical Unloading Area	85,000

Item	Description		Cost Estimate ($)
2.5		Field Equipment and Instrumentation	55,000
2.6		Control System Programming	45,000
2.7		Commissioning and Handover	30,000
		Sub-Total	508,000
9	**Project management**		
9.1		Project Management - Automation	60,000
		Sub Total	**568,000**
7	**Contingency**		
7.1		Contingency	102,000
TOTAL			**670,000**

Source: *Business Case: Kalbar WTP Long Term Planning and Options* (Seqwater, February 2012)

Table 127 Cost breakdown for Project 3

Item	Description		Cost Estimate ($)
1	**Design**		
1.1		Concrete Bund repair	45,000
1.2		Access Improvements	20,000
1.3		Security Fence	85,000
1.4		Piping and valves	50,000
1.5		Supernatant Management Improvement	200,000
		Sub Total	400,000
9	**Project management**		
9.1		Project Management – Sludge System Improvement	40,000
		Sub Total	**440,000**
7	**Contingency**		
7.1		Contingency	80,000
TOTAL			**520,000**

Source: *Business Case: Kalbar WTP Long Term Planning and Options* (Seqwater, February 2012)

It was investigated whether it would be possible to delay the works which will allow automation of the plant, however due to the current plant capacity it will not be possible to meet predicted demand without incurring the extra costs of longer manned operation.

The use of similar sized projects carried out in SEQ (with Rawlinson's construction cost index applied), SKMs internal cost database, industry data and quotations for similar components are an appropriate method for determining preliminary costs estimates. Seqwater indicates that for Project 1 a design then construct delivery method will be utilised and for Projects 1 and 2 a design and construct delivery method utilised. Going to the market during the design then construct or design and construct process will results in competitive pricing.

7.20.6. Policy and procedures

Seqwater's standard process for development and approval of a business case have been followed. It is anticipated that the procurement process for the engagement contractors for the design then construct and design and construct processes will followed.

7.20.7. Timing and deliverability

The *Business Case: Kalbar WTP Long Term Planning and Options* (Seqwater, February 2012) outlines to proposed project programs for the delivery of each of the sub-projects, **Table 128**.

- **Table 128 Project program**

Activity	Project 1 - Completion date	Project 2 - Completion date	Project 3 - Completion date
Approval by Board of this Business Case	March 2012	March 2012	March 2012
Finalise detailed design and cost revision	June 2012	June 2012	
Concept design and cost revision completed (from Opex budget only)	-	-	April 2012
Re-submission to Board for approval to proceed into tender process (If more than 30% greater than the budget proposed in this Business Case)	September/October 2012	-	May 2012
Finalise tender documentation and specification, and advertise	January 2013	-	July 2012
Construction and commissioning completion	December 2013	December 2012	February 2013
Practical completion	March 2014	February 2013	April 2013
Final completion	April 2015	April 2014	April 2014

At this stage, it is expected that each of the projects will be completed within the specified timeframes.

7.20.8. Efficiency gains

No efficiency gains have been identified for this project.

7.20.9. Allocation of overhead costs

Seqwater have advised that a 20% contingency has been applied for Project 1 and 25% for Projects 2 and 3.

7.20.10. Summary

Project 1 is assessed as prudent. The primary driver of compliance has been demonstrated and an appropriate decision making process has been documented. Projects 2 and 3 are assessed as prudent.

Insufficient information has been provided for Projects 2 and 3 to allow an efficiency assessment to be completed.

Project 1 is assessed efficient as the scope is appropriate, the standards of works are consistent with industry practice and the costs are reasonable and will be market tested.

The value of expenditure considered to be prudent and efficient is outlined below in **Table 129**.

- **Table 129 Boonah Kalbar Water Treatment Plant – Automation/Pipeline Upgrade - revised capital expenditure profile**

Project	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
Boonah Kalbar Water Treatment Plant – Automation/Pipeline Upgrade						
Project 1	300	2,500	2,758	-	-	5,558
Project 2	0	0	0	-	-	0
Project 3	0	0	0	-	-	0
Total	**300**	**2,500**	**2,758**	**-**	**-**	**5,558**

Additional information required to allow efficiency assessment of Projects 2 and 3:

- Finalised investigations with costs and timeframes

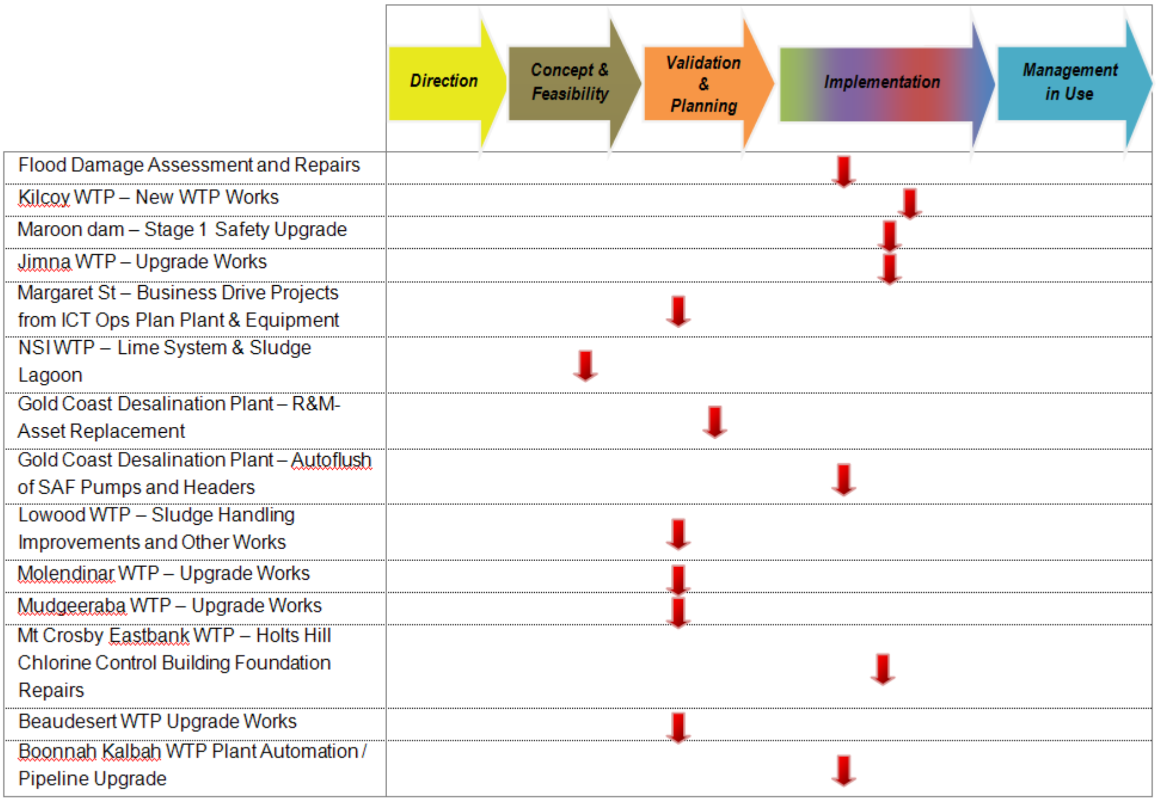
The adequacy of the information provided on this project is outlined below in **Table 130**.

- **Table 130 Adequacy of information provided**

Section of Capex review	Boonah Kalbar Water Treatment Plant – Automation/Pipeline Upgrade		
Project description			
Provided documentation			
Prudency			
Cost driver			
Decision making process			
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

7.21. Overall Summary

A sample of fourteen projects were identified and assessed as a representative sample of the capital expenditure program for 2012/13 for Seqwater. We have assessed these projects against the Authority's definitions of prudency in particular the relevant driver and the decision making process and efficiency, including the standards of service, scope of work, timeliness of delivery and the costs.



▪ **Figure 17 Status of projects within the Seqwater Delivery Framework**

The capital expenditure of six of fourteen projects were assessed as both prudent and efficient. The exceptions are:

- Flood Damage Assessment and Repairs
- Maroon Dam - Stage 1 Safety Upgrade
- North Stradbroke Island Water Treatment Plant - Lime System and Sludge Lagoon
- Lowood Water Treatment Plant - Sludge Handling Improvements and Other Works
- Molendinar Water Treatment Plant - Upgrade Works
- Mudgeeraba Water Treatment Plant - Upgrade Works
- Beaudesert Water Treatment Plant Upgrade Works
- Boonah Kalbar Water Treatment Plant - Plant Automation/Pipeline Upgrade

The summary of the outcomes are included below in **Table 131**.

▪ **Table 131 Sample project summary - revised capital expenditure profile ($000s)**

Project	Cost 2012/13 ($000s)	Prudent	Efficient	Revised Cost 2012/13 ($000s)
Flood Damage Assessment and Repairs	9,848	Prudent	Insufficient information to assess all expenditure as	0

Project	Cost 2012/13 ($000s)	Prudent	Efficient	Revised Cost 2012/13 ($000s)
			efficient	
Kilcoy WTP - New WTP Works	14,931	Prudent	Efficient	14,931
Maroon Dam - Stage 1 Safety Upgrade	4,000	Prudent	Insufficient information to assess all expenditure as efficient	3,800
Jimna WTP - Upgrade Works	1,661	Prudent	Efficient	1,661
Business Driven Projects from ICT Ops Plan Plant & Equipment	1,700	Prudent Note: Insufficient information to assess expenditure beyond 2012/13 as prudent	Efficient Note: Insufficient information to assess expenditure beyond 2012/13 as efficient	1,700
NSI WTP - Lime System & Sludge Lagoon	1,075	Insufficient information to assess expenditure as prudent	Efficiency not assessed	0
Gold Coast Desalination Plant - R&M-Asset Replacement	3,812	Prudent	Efficient	3,812
Gold Coast Desalination Plant - Autoflush of SAF Pumps and Headers	1,975	Prudent	Partially efficient	1,544
Lowood WTP - Sludge Handling Improvements and Other Works	2,000	Prudent	Insufficient information to assess expenditure as efficient	0
Molendinar WTP - Upgrade Works	2,000	Insufficient information to assess expenditure as prudent	Efficiency not assessed	0
Mudgeeraba WTP - Upgrade Works	2,000	Insufficient information to assess expenditure as prudent	Efficiency not assessed	0
Holts Hill Chlorine Control Building Foundation Repairs	1,654	Prudent	Efficient	1,654
Beaudesert WTP Upgrade Works	2,500	Insufficient information to assess expenditure as prudent	Efficiency not assessed	0
Boonah Kalbar WTP Plant Automation / Pipeline Upgrade	2,500	Prudent	Insufficient information to assess all expenditure as efficient	2,500

▪ **Table 132 Seqwater capital expenditure review 2012/13**

Section of Capex review	Flood Damage Assessment and Repairs	Kilcoy WTP - New WTP Works	Maroon Dam Stage 1 Safety Upgrade	Jimna Water Treatment Plant Upgrade Works	Business Driven Projects from ICT Ops Plan Plant and Equipment	NSI Lime System Sludge Lagoon	GCDP Repairs & Maintenance	GCDP Autoflush SAF Pumps Header	Lowood WTP – Sludge Handling Improvements	Molendinar Water Treatment Plant upgrade	Mudgeeraba Water Treatment Plant Upgrade	Holts Hill Chlorine Control Building foundation repairs	Beaudesert Water Treatment Plant Upgrade	Boonah Kalbar Water Treatment Plant – Automation/Pipeline Upgrade
Project description														
Provided documentation														
Prudency														
Cost driver														
Decision making process														
Efficiency														
Scope of works														
Standards of work														
Project cost														
Policy and procedures														
Timing and deliverability														
Efficiency gains														
Allocation of overhead costs														

Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

Comparing the project status, prudency and efficiency assessment and adequacy of information illustrates that projects further along the implementation journey are more likely to have more adequate information and be assessed as prudent and efficient. It is noted that this assessment is at a specific point in time, and that the purpose of this review is to determine the validity of entry of costs into the RAB.

Consequently there is a situation whereby this review is unable to confirm the prudency or efficiency due to its position in the implementation journey, whilst good practice requires an allowance to be made in Seqwater's forward budget.

Where prudency and/or efficiency cannot be established, this does not solely mean that the project is inappropriate, it may mean that the status of the project is not sufficiently progressed to enable confirmation of entry of all costs into the RAB. A contributing factor to this maybe the frequency of reviews being shorter than the implementation period of large capital expenditure projects.

For the Flood Damage Assessment and Repairs the additional information required includes:

- A complete breakdown of the costs associated with the project across the three years to 2013/14

For the Maroon Dam - Stage 1 Safety Upgrade the additional information required includes:

- Confirmation of the scope of the project that is being implemented in Stage 1
- Justification of the budget allowance of $ 4 million and $ 3 million in 2012/13 and 2013/14 respectively to implement Stage 1, when compared to the other estimates, which indicate a substantially lower amount
- Explanation of why the project business case and the grid service charges information return spreadsheet show capital expenditure which differ of $ 7.9 million and $ 7.25 million respectively

For the North Stradbroke Island Water Treatment Plant - Lime System and Sludge Lagoon the additional information required includes:

- Confirmation from DERM regarding the ability to transfer existing water extraction licences
- Information regarding the choice of pH correction chemical compound
- A detailed scope of works
- Information indicating the capacity of the sludge lagoon with accompanying justification and preliminary drawings
- A cost breakdown of Seqwater's supply and install costs for the lime dosing configuration

For the Lowood Water Treatment Plant - Sludge Handling Improvements and Other Works the additional information required includes:

- Options Assessment report including costs
- Tender review report for engagement of consultant for Options Assessment
- Business Case

- Information on project timeline

For the Molendinar Water Treatment Plant - Upgrade Works the additional information required includes:

- Advise details of completion of Options Assessment
- Advise date of approved Business Case
- Business Case
- Options Report

For the Mudgeeraba Water Treatment Plant - Upgrade Works the additional information required includes:

- Advise details of completion of Options Assessment
- Advise date of approved Business Case
- Business Case
- Options Report

For the Beaudesert Water Treatment Plant Upgrade Works the additional information required includes:

- Confirmation of the cost driver
- Needs analysis

For the Boonah Kalbar Water Treatment Plant Plant Automation /Pipeline Upgrade the additional information required includes:

- Finalised investigations with costs and timeframes

One of the fourteen projects has been assessed as efficient however insufficient information was provided, it is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment to be made of Jimna Water Treatment Upgrade Works. This information must include:

- Specifics of feasibility / options assessment
- Any option studies, including any assessment of the 'do nothing' option to justify the level of automation selected for the plant
- Cost details of operational efficiencies, such as from the turn down ration which will enable the new plant to be operated continuously at a low rate during periods of base load demand
- Options analysis or cost comparison used to ensure particular elements of the selected scope of work are the best means of achieving the desired outcomes
- Evidence that off-site sludge handling or disposal has been considered as an alternative to a new sludge handling system

- Confirmation of process design limits, in particularly turbidity
- Justification of escalation rate

8. Capital expenditure 2011/12

8.1. Sample selection

The Terms of Reference included the following:

"The consultant must assess the prudency and efficiency of 2011/12 non-drought[4] capital expenditure for each GSP that:

d) was not submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011/12 GSC investigation; and

e) is material, where materiality is defined as exceeding $2 million;

The consultant must also assess the efficiency only of the 2011/12 non-drought capital expenditure for each GSP that:

f) was submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011/12 GSC investigation; and

g) differs significantly (more than 30%) from the forecast costs submitted by the GSP during the 2011/12 investigation."

A sample of the capital expenditure projects from the 2011/12 budget were chosen in consultation with the Authority for detailed analysis is shown below in **Table 133**. These projects are assessed in detail in the following sections with an overview of the final assessment found in **Table 134**.

- **Table 133 2011/12 capital expenditure project reviewed ($000s)**

Project	QCA approved value 2011/12 ($000s)	Estimated actual value 2011/12 ($000s)
North Pine Dam Gates Upgrade	-	873
Mt Crosby WTP Water Quality Improvement	1,000	3,769
North Pine WTP filter upgrade	1,800	2,551
Mt Crosby Eastbank WTP High Voltage Renewals	690	1,374
North Pine WTP fluoride dosing point relocation	435	1,048
Mt Crosby Westbank Renewals	383	814
Various WTP Chemical Dosing Improvements	750	1,132
Mt Crosby Eastbank Renewals	670	1,049
AMS: P&C - Intranet Stage 2 & 3	120	400
Caboolture WTP Renewals	143	378
Esk WTP Renewals	85	289
Total Sample (11 projects)	**6,076**	**13,677**
Percentage of 2011/12 costs	**13%**	**28%**

[4] Non-drought capital expenditure refers to capital expenditure that was not required as part of the Water Regulation 2002 or the Regional Water Security Program. As a consequence, it excludes many of the largest capital expenditure projects undertaken by the GSPs, such as the Hinze Dam raising or the Northern Pipeline Interconnector Stage 2.

8.2. Overview of prudency and efficiency

Table 134 shows an overview of the final assessment made for each project of the 2012/13 project sample chosen for assessment of prudency and efficiency. A full summary with recommendations for each project can be found in the following sections of this report.

- **Table 134 Overview of prudency and efficiency of 2011/12 capital expenditure sample selection**

Project	Estimated actual value 2011/12 ($000s)	Prudent	Efficient
North Pine Dam Gates Upgrade	873	Prudent	Efficient
Mt Crosby WTP Water Quality Improvement	3,769	Assessment not required	Efficient
North Pine WTP Filter Upgrade	2,551	Assessment not required	Insufficient information to assess expenditure as efficient
Mt Crosby Eastbank WTP High Voltage Renewals	1,374	Assessment not required	Insufficient information to assess expenditure as efficient
North Pine WTP Fluoride Dosing Point Relocation	1,048	Assessment not required	Efficient
Mt Crosby Westbank Renewals	814	Assessment not required	Efficient
Various WTP Chemical Dosing Improvements	1,132	Assessment not required	Insufficient information to assess expenditure as efficient
Mt Crosby Eastbank Renewals	1,049	Assessment not required	Efficient
AMS: P&C - Intranet Stage 2 & 3	400	Assessment not required	Efficient
Caboolture WTP Renewals	378	Assessment not required	Efficient
Esk WTP Renewals	289	Assessment not required	Insufficient information to assess expenditure as efficient

8.3. North Pine Dam Gates Upgrade

8.3.1. Proposed capital expenditure

Table 135 shows 2011/12 estimated actual value of the North Pine Dam Gates Upgrade within the 2011/12 budget. No budget was submitted or approved by the Authority.

- **Table 135 North Pine Dam Gates Upgrade – change in 2011/12 capital expenditure**

Source	2011/12 Costs ($000s)			
	QCA approved value	Estimated actual value	Difference	% increase
A7 2012-2013 GSC Information Return Capex 2011-12.xlsx	0	873	873	∞

8.3.2. Project description

The North Pine Dam Gates Upgrade project is for the installation of a new emergency backup system to operate the five radial gates at North Pine Dam. The new backup system will be the second backup operating system for the radial gates, with the mains power supply system being the main, and the emergency generator being the first backup. The new emergency backup system is urgently required to guarantee the operation of the radial gates and the safety of the dam.

North Pine Dam is a gated dam on the North Pine River, impounding Lake Samsonvale. The dam is a 39 m high concrete gravity dam with earth/rock shoulder embankments that store approximately 214,000 ML of water that feeds the North Pine Water Treatment Plant. The most recent major dam safety inspection found that the redundancy of the current backup system was not satisfactory to guarantee the safety of the dam in a flood event. This issue became evident in the January 2011 flood event. A new backup system is urgently required to guarantee the safety of the dam and prevent a dam failure in a major flood event.

8.3.3. Provided documentation

The key reference documents used for this review are:

- *A7 2012-2013 GSC Information Return Capex 2011-12*, Seqwater, February 2012
- *North Pine Dam Acceptable Flood Capacity (AFC) Report*, URS, February 2012
- *North Pine Dam – New Hydraulic Backup System*, Seqwater [no date]
- Letter: North Pine Dam Radial Gates Justification Summary, Robert Drury [no date]
- North Pine Dam emergency backup system HAZOP report
- *Formal Instrument of Agreement – Contract Number 443*, Seqwater, October 2011
- Spreadsheet - North Pine Dam Cost Tracking
- North Pine Dam Design Change Register
- *Project Management Plan: North Pine Dam Radial Gates Hydraulic Backup System*, Seqwater, January 2012

8.3.4. Prudency

According to the terms of reference when assessing items for the prudency and efficiency of 2011/12 estimated actual capital expenditure:

> *"The consultant must assess the prudency and efficiency of 2011-12 non-drought[5] capital expenditure for each GSP that:*
>
> *a) was not submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*

[5] Non-drought capital expenditure refers to capital expenditure that was not required as part of the Water Regulation 2002 or the Regional Water Security Program. As a consequence, it excludes many of the largest capital expenditure projects undertaken by the GSPs, such as the Hinze Dam raising or the Northern Pipeline Interconnector Stage 2.

b) is material, where materiality is defined as exceeding $2 million;

The consultant must also assess the efficiency only of the 2011-12 non-drought capital expenditure for each GSP that:

a) was submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and

b) differs significantly (more than 30%) from the forecast costs submitted by the GSP during the 2011-12 investigation."

As this project was not submitted as part of last year's review an assessment of prudency has not been completed.

Cost driver

A cost driver for the project has not been nominated by Seqwater.

During the January 2011 floods, the largest flood on record passed through North Pine Dam. This flood, although nowhere near the Probable Maximum Flood, resulted in floodwaters passing around the gates and flowing over areas that are used to operate the gates. In addition, post flood analysis of the rainfall quantities and intensities indicated a significant discrepancy with the previous flood study estimates. The January flood event rainfall was of the order of a 0.02% to 0.05% Annual Exceedance Probability (AEP) (1 in 200 to 1 in 500 year flood events), however this rainfall resulted in a level in the dam that was previously estimated to be produced from a 0.01% AEP (1 in 10,000 year) Rainfall Event. This discrepancy was submitted to the Dam Safety Regulator following the event and Seqwater were required to undertake a review of the flood capacity of the North Pine Dam.

From this work study and other assessments of the dam undertaken by Seqwater there were four key issues identified that required upgrading at North Pine Dam:

- The existing back up trailer for the operation of the gates was found to be inadequate. The January 2011 flood event occurred so rapidly that the operator would not have been able to mobilise and operate the trailer quickly enough to avoid the risk of dam failure if power to the winch motors had been lost during the January 2011 flood event. Another alternative back up was required.
- The operating position at the lower platform near to the radial gate is inundated at high water levels in the storage and is not safe for operators to access once the gates are raised above increment 17 (out of the 23 increments available on the gates). Therefore for the safety of the operators during large flood events, the gate controls were duplicated on the top deck to remove the OH&S risks associated with the operators working in knee depth water.
- The estimates of the Probable Maximum Flood increased significantly due to the changes in the model calibration resulting from the observed performance of the dam. The URS Study looked at the critical levels for the dam and determined that the inundation of the hoist motors and brakes was a critical control on the flood capacity of the dam. If works are undertaken to ensure that there is adequate backup for the radial gate motors the AFC percentage that can be passed can be increased to approximately 65%.

- If the gate operations are delayed and water inundates the brakes and electric motors for the gates (this occurred in 1986), it would not be possible to open the gates in time to prevent dam failure for events greater than the 1% AEP (1 in 100 year) Flood Event. This risk is completely unacceptable for a dam with an Extreme Hazard Rating.

Given the outcomes of the January 2011 flood event, the concerns of the Dam Safety Regulator and the clear risks identified, it was considered that the upgrade of the gate backup systems was an urgent task that should be completed as soon as practicable. This provides the opportunity to delay the future required upgrade and dramatically reduces the risk of dam failure.

There is thus a need to implement upgrades to the gate operating system to allow the gates to be operated under extreme flood conditions. This was discussed with the Dam Safety Regulator and they agreed this was a satisfactory and necessary method of providing an acceptable flood passing capacity for the dam. This is required as part of the licence conditions of the dam.

Decision making process

There are three options identified for guaranteeing the operation of the radial gates and the safety of the dam in a major flood event:

Option 1 – Design and Install new second backup system

Option 2 – Defer the project specified on option 1 by 1 to 2 years

Option 3 – Do nothing. Keep on operating with the lack of redundancy in the backup system

The advantages and disadvantages of the options are discussed below in **Table 136**.

- **Table 136 Options assessed**

Options	Upside	Downside
Option 1	Guarantees operation of the radial gates and the safety of the dam. Satisfies the dam safety requirements as per inspection.	Capital cost
Option 2	Defer Cost	Unacceptable risk of a disastrous dam failure in a major flood event
Option 3	No Cost	Unacceptable risk of a disastrous dam failure in a major flood event

Source: *North Pine Dam – New Hydraulic Backup System* (Seqwater, no date)

Option 1 was assessed to be the only viable option, as the backup system was required to be in place prior to the next wet season.

Two options were considered for project delivery:

- Design and construct
- Design then construct - identified as preferred option for delivery due to increased Seqwater control and scope for significant involvement of the operations, maintenance and dam safety departments, leading to reduced cost and risk

The project has been assessed as product. The driver of compliance has been demonstrated. An acceptable decision making process has been used.

8.3.5. Efficiency

Seqwater has advised that no expenditure was included in the 2011/12 approved expenditure as the project was identified as a result of the January 2011 floods and therefore was not planned as part of the 2011/12 works program.

The scope of works

The scope of works for the project is to design, install and commission a new hydraulic backup system to operate the radial gates at North Pine Dam. The *North Pine Dam – New Hydraulic Backup System* (Seqwater, no date) identifies the following:

"The design of the hydraulic backup system will need to satisfy the following criteria.

1) *The new backup system will comprise*
   - *a trailer mounted hydraulic power pack*
   - *a new hydraulic motor, clutch and brake system coupled to the existing gate winch drive system*
   - *a control station at each radial gate*
   - *a local lighting system incorporated in the trailer and at each control station*
   - *fixed hydraulic oil pipe work*
2) *The main drive system of the gates is a 5.5KW 6 pole motors. The new backup system will perform the duty of these units, as it will be required when there has been mains power supply and generator failure, and the motors will not have a power supply to allow operation.*
3) *The new backup system will be designed to operate three radial gates simultaneously. In normal operation the system will only operate one gate at a time, but in a severe flood event, three gates may be required to be operated at once to protect the dam.*
4) *Operate the gates at the same speed or faster than the main electrical operating system. The main electrical operating system raises the radial gates at a rate of 0.0059m/s, the new backup shall, as a minimum, match this speed so that the operating parameters of the dam do not change.*
5) *The new system shall be stand alone, with its own power supply. As this is a backup system it is required to be independent of the mains power and backup diesel generator power at the dam. The power to operate the system shall be supplied by a diesel motor.*
6) *The new backup system shall allow the exiting second backup system to remain operational. Currently there is a backup system that is petrol motor driven, which utilises a coupling and drive shaft mechanism (shown in photo below) to operate the gates. This system, even though it is slow in swapping between gates, will be kept as the third backup, and the new system will have to accommodate for its operation.*

7) *The new drive motor can be coupled to the existing system, at either the three way gearbox or by modifying the main drive gearbox. The designer shall determine the preferred coupling option. Seqwater will consider any other option that the designer may propose.*
8) *The design shall incorporate a mechanism for the disengagement of the existing brake system. The main electrical operating system has a solenoid operated brake system, shown below. For the operation of the new backup system this brake system, will have to be bypassed or controlled by the new system. Seqwater has assumed a hydraulic ram will be installed to perform this function. Release of the brake will be interlocked with supply of hydraulic power to the new hydraulic drive motor.*
9) *The new backup system shall have its own waterproof brake system. An additional waterproof brake system shall be installed to hold the gate in position. The new water proof brake system is required as the drive unit may be submerged in a severe flood event, which may affect the main brake system which in not waterproof. The brake system is very important as it holds the gate open and stops it closing under its own weight after it has been raised. The brake system will be Interlocked with the supply of hydraulic power to the new hydraulic drive motor, so that it will be automatically released when the hydraulic motor operates that gate.*
10) *The new backup drive system shall include a clutch so that the hydraulic drive motor is not driven by the 5.5kW 6 pole Electric Drive Motor when the backup system is not in use. The clutch system shall be engaged and disengaged using the controls at the gate's control station, before the new backup system can be operated. The clutch system shall be waterproof as it may be submerged in a severe flood event.*
11) *All materials used in the backup system will be of high quality, with all pipe work being stainless steel, and system components need to be readily available, or critical spares held by Seqwater locally*
12) *The main hydraulic power unit shall be mobile. The unit will be trailer mounted, which will include hydraulic pump diesel motor, fuel tank with at least 12 hours running time, and a 240 volt generator to supply power for the localised lighting of the dam. The hydraulic unit shall connect into the main system with pressure rated quick couplers near gate C, the middle gate of the five gates.*
13) *Gate control station for the new backup system shall be installed in a stainless steel cabinet on or near the top handrail on the top of the dam wall. The control station shall also be installed near the entrance stairs of the radial gates. Shown below.*
14) *Lighting of the control stations shall be considered. The mobile hydraulic power unit shall have a generator to supply power to the dams lighting as well as lighting to be installed in the control stations. A lighting tower shall also be installed on the mobile hydraulic unit to light up the area around the unit"*

The scope is assessed as appropriate for the project.

Standards of works

The standards of works adopted for this project have not been specified in documentation received to date. It has been anticipated that industry standards will be utilised.

Project cost

Table 137 shows a breakdown of the expected project costs.

- **Table 137 Estimated project costs**

Description	Effort (days)	Daily Rate ($)	Cost ($)
Internal staff/contractor costs			
Project Manager	70	1,560	109,200
Dam Operations	10	800	8,000
Dam Operations	10	800	8,000
Total – Internal staff/contractor costs			**125,200**
External costs			
Detailed Design			45,000
Construction Supervision and commissioning			85,000
Ring Main Installation			109,750
Hydraulic Control Station and Machinery Room Install			30,003
Documentation, design, drafting and admin			8,000
Total – External costs			**277,756**
Fixed and other costs			
Major Hydraulic Components			287,590
Trailer Construction, hydraulic piping and consumables			101,033
Diesel Engine			26,060
Total - Fixed and other costs			**414,683**
Total – Project costs			**817,639**
Contingency			55,361
TOTAL			**873,000**

Source: *Project Management Plan: North Pine Dam Radial Gates Hydraulic Backup System* (Seqwater, January 2012)

Due to the urgency of the project a specialist designer (Practical Engineering) was identified and sole sourced via a waiver in June 2011. This approach was taken to ensure the design was developed in time to guarantee the safety of the dam and minimise the procurement timeframe whilst still ensuring value for money.

During the design phase Practical Engineering identified any long lead items that could not be substituted for a different make or model and would delay the project if not procured in enough time. Practical Engineering identified the gearboxes for the gates as having a 20 week lead time and no suitable substitutes available on the market. Seqwater held discussions with the supplier and negotiated a 10 week lead time if ordered prior to the end of July 2011. A waiver of the three quote process was approved in July 2011 and an order was placed for the Bonfiglioli gearboxes.

A waiver of the tender process and sole source of Fluidpower to an upper value of $ 576,870 was sought and approved on the 23 August 2011. An RFQ was then issued to Fluidpower that included a copy of the proposed contract that was to be used for the project. The quote from Fluidpower and Queensland Hydrants are comparable, being 4% different. This is a defacto testing of the prevailing market conditions.

Fluidpower provided a quotation on 1 September 2011 for $ 527,750 that was within the limits of the waiver however, they also requested changes to the contract terms and conditions. The changes to the terms and conditions were mainly concerned with liability as Fluidpower was initially not willing to provide the level of insurances required by Seqwater. Negotiations progressed slowly as when agreements were reached on the contract changes requested, Fluidpower then requested additional changes. The negotiations were terminated on 16 September 2011 as Fluidpower was only going to accept a liability cap to the value of the contract with a carve out of the amount they recover under insurance i.e. $ 15 million claim where insurer only accepted $ 10 million, Fluidpower did not want to be liable for the other $ 5 million. Seqwater's insurance broker confirmed that the Seqwater insurer would not accept anything less than a $ 10 million liability.

As there was a risk that negotiations with Fluidpower were not going to succeed alternative contractors were identified and contacted. A meeting was held with Queensland Hydraulics on 16 September 2011 to determine their capacity, interest and ability to deliver the works. Due to the length of time negotiating with Fluidpower and the lead times for the major components, Queensland Hydraulics did not believe a completion date of 1 December 2011 was still achievable. Queensland Hydraulics agreed to the a new practical completion date of 27 January 2012 and provided a quotation on 29 September 2011 for the amount of $ 548,768.02. Though it has not been stated in the documentation, it is assumed that Queensland Hydraulics agreed to the $ 15 million liability.

Notwithstanding the above, the allowance for the procurement management at 70 days (12 weeks) is generous.

8.3.6. Policy and procedures

Seqwater have not followed their standard procurement process in tendering the works for this project due to the critical timeframe. A sole sourced tendered approach was adopted to ensure that the completion date could be met. Waivers were sought and received; this is considered to be acceptable due to the risks involved with delaying the project.

8.3.7. Timing and deliverability

The *Project Management Plan: North Pine Dam Radial Gates Hydraulic Backup System* (Seqwater, January 2012) outlines the key deliverables and timeframes for the project, as presented below in **Table 138.**

- **Table 138 Key deliverables and timeframes**

Phase/Task	From	To	Deliverable(s)
Concept design	17/06/11	05/07/11	Five concept designs for review
Detailed design HAZOP	25/07/11	25/07/11	Risk workshop of 75% detailed design
Final design	25/07/11	04/08/11	Completed detailed design

Phase/Task	From	To	Deliverable(s)
Procure contractor	15/08/11	20/09/11	Award construction contract
Construction	17/10/11	13/01/12	Complete installation of the hydraulic system
Commissioning	13/01/12	03/02/12	System testing results
Practical completion	27/01/12	20/02/12	Handover of system to operations

Based on this information the project should have been completed and handed over. Whilst no update on the current progress of the project has been provided, it is understood that the system is operating.

8.3.8. Efficiency gains

No efficiency gains have been identified for this project.

8.3.9. Allocation of overhead costs

Table 139 includes the percentage of the various overheads.

- **Table 139 Overheads**

Overhead Description	% (of Project Total Cost)
Project Management	12.51%
Detailed Design	5.15%
Construction Supervision and Commissioning	9.74%
Contingency	6.34%

The project management costs and supervision costs are at the upper end to the typical range.

8.3.10. Summary

The project is assessed as prudent. The primary driver of compliance has been demonstrated and an appropriate decision making process has been documented. While the normal procedures have not been followed, waivers were sought and received from these procedures and this is considered to be appropriate considering the urgency of the project due to significant risk to life and property.

The project is assessed as efficient as the scope is appropriate, and the costs are reasonable and have been marked tested by defacto.

The value of expenditure not considered to be prudent and efficient: Nil.

The adequacy of the information provided on this project is outlined below in **Table 140**.

- **Table 140 Adequacy of information provided**

Section of Capex review	North Pine Dam Gates Upgrade
Project description	
Provided documentation	
Prudency	
Cost driver	

Section of Capex review	North Pine Dam Gates Upgrade		
Decision making process			
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

8.4. Mt Crosby Water Treatment Plant Water Quality Improvement

8.4.1. Proposed capital expenditure

Table 141 shows the proposed cost of the Mt Crosby Water Treatment Plant Water Quality Improvement within the 2011/12 budget.

- **Table 141 Mt Crosby Water Treatment Plant Water Quality Improvement – capital expenditure 2011/12**

Source	2011/12 Costs ($000s)			
	QCA approved value	Estimated actual value	Difference	% increase
A7 2012-2013 GSC Information Return Capex 2011-12.xlsx	1,000	3,769	2,769	277

As can be seen in **Table 141**, the estimated actual 2011/12 expenditure is approximately $ 2,769, 000 or 277% greater than the value approved by the Authority.

It should be noted that the Mt Crosby Water Treatment Plant Water Quality Improvement project within the *A7 2012-2013 GSC Information Return Capex 2011-12.xlsx* is the same project as the Mt Crosby Eastbank and Westbank Water Treatment Plants Chemical System Upgrade project in *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm*.

8.4.2. Project description

The Mt Crosby Water Treatment Plant Water Quality Improvement involves the upgrading of a number of chemical systems to enable the plants to better manage dirty water events with regard to turbidity and manganese events. This project was initially proposed for the 2010/11 financial year budget, *Business Case – Large Projects: Mt Crosby Chemical Systems Upgrade* (Seqwater, September 2010), with an estimated value of $ 2.1 million ± 30% due to issues with high levels of turbidity and manganese in the raw water supply over the summer of 2008/09 during which the plants struggled to maintain water quality at the required standard. Following the January 2011 flood subsequent upgrades were identified in *Business Case – Large Projects: Mt Crosby Chemical Systems Upgrade – Addendum 1* (Seqwater, April 2011) with an estimated value of $ 0.78 million ± 10% in addition to the $2.1 million. In June 2011 the upgrade of the caustic dosing system at Eastbank Water Treatment Plant was approved to be included within the contract for the Design and Construction of the Mt Crosby Chemical Dosing Systems Upgrade.

Project items included in the Chemical System Upgrade project are associated with the following process areas:

- Eastbank:
  - caustic dosing system
  - potassium permanganate dosing system
  - the existing polymer system
  - existing hypochlorite dosing system
  - chlorine and pH analysis
  - redundant control of the chemical systems
  - new polymer batching system
  - flocculent aid and filter aid dosing system
- Westbank:
  - potassium permanganate system
  - raw water flow measurement
  - polymer batching systems
  - flocculent aid, filter aid and thickening aid dosing systems

8.4.3. Provided documentation

The key reference documents used for this review are:

- *Seqwater 2012-13 Grid Service Charges: Submission to the Queensland Competition Authority*, Seqwater, February 2012
- *A7 2012-2013 GSC Information Return Capex 2011-12.xlsm*, Seqwater, February 2012
- *A8 2012-2013 GSC Information Return Capex 2012-13.xlsm*, Seqwater, February 2012
- *Business Case – Large Projects: Mt Crosby Chemical Systems Upgrade*, Version 4, Seqwater, September 2010
- *Business Case – Large Projects: Mt Crosby Chemical Systems Upgrade – Addendum 1*, Version 1, Seqwater, April 2011
- *Mt Crosby Chemical Systems Upgrade: Board meeting paper contract for approval*, Seqwater, 6 May 2011
- *Mt Crosby Chemical Systems Upgrade – Eastbank Caustic Dosing Systems: Board meeting paper contract for approval*, Seqwater, 15 June 2011

- *Variation Price Request Register: Mt Crosby East & Westbank WTP – Chemical Dosing System Upgrade*, Paynter Dixon, no date
- Mt Crosby schedule of rates (contractually agreed) Annexure Part H, no date
- *Condition and Recommendation report - Mt Crosby Eastbank Caustic dosing system*, Rev 1.1, Seqwater, no date
- *Internal Memorandum Re: Request for waiver: Mt Crosby Eastbank caustic dosing system replacement*, Bart Vervetjes (Seqwater), 10 June 2011
- Mt Crosby Eastbank Water Treatment Plant: Pre-coagulation Caustic dosing system replacement - Scope of Work, Seqwater, no date
- *Budget Mt Crosby Chemical System Upgrade*, no author, no date

8.4.4. Prudency

According to the terms of reference when assessing items for the prudency and efficiency of 2011/12 estimated actual capital expenditure:

> *"The consultant must assess the prudency and efficiency of 2011-12 non-drought[6] capital expenditure for each GSP that:*
>
> *a) was not submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*
>
> *b) is material, where materiality is defined as exceeding $2 million;*
>
> *The consultant must also assess the efficiency only of the 2011-12 non-drought capital expenditure for each GSP that:*
>
> *a) was submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*
>
> *b) differs significantly (more than 30%) from the forecast costs submitted by the GSP during the 2011-12 investigation."*

As this project was submitted as part of last year's review an assessment of prudency is not required.

8.4.5. Efficiency

The scope of works

The project comprises a number of activities including the following:

- Eastbank:
  - caustic dosing system
  - potassium permanganate dosing system

[6] Non-drought capital expenditure refers to capital expenditure that was not required as part of the Water Regulation 2002 or the Regional Water Security Program. As a consequence, it excludes many of the largest capital expenditure projects undertaken by the GSPs, such as the Hinze Dam raising or the Northern Pipeline Interconnector Stage 2.

- the existing polymer
- existing hypochlorite dosing system
- chlorine and pH analysis
- redundant control of the chemical systems
- new polymer batching system
- flocculent aid and filter aid dosing system

- Westbank:
  - potassium permanganate system
  - raw water flow measurement
  - polymer batching systems
  - flocculent aid, filter aid and thickening aid dosing system

The initial business case for the Mt Crosby Chemical Dosing Systems Upgrade included a project item for one new caustic pump skid consisting of five new dosing pumps and electrical panels. The caustic dosing system replacement has been included as an additional project however the exact scope has not been outlined. Without clarification of what is involved in the scope for the Eastbank caustic dosing system replacement there is the possibility that there is overlap between the initial project item and the caustic dosing system replacement project.

Alternative options were examined, including the do nothing approach.

Based on the provided information it is concluded that the scope presented by Seqwater is the best means of achieving the desired outcomes.

Standards of works

Within the *Business Case – Large Projects: Mt Crosby Chemical Systems Upgrade* (Seqwater, September 2010) Seqwater identify that the project will be delivered as a design and construct project in accordance with AS4902 General Conditions of Contract for Design and Contract, technical specification and that the contract will include various hold points to ensure that the design meets Seqwater's objectives.

Project cost

The estimated cost of work associated with the initial scope of the project was $ 2.1 million ± 30%, as outlined below in **Table 142**. The estimate was determined based on quotations from reputable suppliers

Table 142 Initial cost estimate for chemical systems upgrade

Description	Cost Component ($)				
	Electrical	Civil	Mechanical	Design & PM	Subtotal
Eastbank Caustic Dosing System	79,900	20,000	109,200	52,300	261,400
Eastbank Pot Perm Dosing System	43,800	4,000	186,000	58,400	292,200
Eastbank Polymer Dosing System	77,000	-	-	19,000	95,000

Eastbank Hypo Dosing System	62,200	-	-	15,600	77,800
Eastbank Dosing Lines	132,500	-	-	31,400	164,900
Eastbank Controls System	444,300	-	-	110,300	554,600
Westbank Pot Perm Dosing System	66,000	13,000	149,600	57,200	285,800
Westbank Raw Water Flow Meter	12,200	121,000	163,000	74,100	370,300
Program Total Budget Estimate				**418,300**	**2,100,000**

Source: *Business Case – Large Projects: Mt Crosby Chemical Systems Upgrade*, Version 4, Seqwater, September 2010

The estimated cost of work associated with the additional scope of the project (polymer system) was $ 784,000 ± 15%, as outlined below in **Table 143**.

- **Table 143 Polymer system cost estimate**

	Cost Component ($)					
Description	**Electrical**	**Civil**	**Mechanical**	**Commissioning/ other cost**	**Design & PM**	**Subtotal**
Eastbank Polymer Dosing System	150,000	3,500	230,000	22,800	101,700	508,000
Westbank Polymer Dosing System	70,000	-	128,000	22,800	55,200	276,000
Program Total Budget Estimate						**784,000**

Source: *Business Case – Large Projects: Mt Crosby Chemical Systems Upgrade – Addendum 1,* Version 1 (Seqwater, April 2011)

Based on the business cases provided, a total of $ 3.63 million has been approved for the Mt Crosby Eastbank and Westbank Water Treatment Plants Chemical System Upgrade, as outlined below in **Table 144**.

- **Table 144 Budget for chemical system upgrade**

Component	Cost Estimate ($)
Initial cost estimate	2,100,000
Polymer system cost estimate	784,000
Sub-total	**3,607,000**
Engineering contingency (25%)	723,000
Total	**3,631,600**

Source: Mt Crosby Chemical Systems Upgrade: Board meeting paper contract for approval (Seqwater, 6 May 2011)

An invitation to submit tenders for a ‘design and construct’ contract for all the project items for the chemical system upgrade works was put to the open market on 22 January 2011 compliant with Seqwater’s procurement strategy. Tenders closed on 8 March 2011 with two tenders received. Seqwater advise that the tenders were evaluated in accordance with its tender Evaluation Plan, resulting in a recommendation to award the contract for delivery of the project to Paynter Dixon Pty Ltd. The *Tender Evaluation and Recommendation Report* has not been provided. The initial contract value is $ 3.3 million. The variation between the market valve and the business case estimates of $ 893,000 can be attributed to tendered prices exceeding those anticipated in the business cases and Seqwater’s internal costs not included in the business case estimates.

For the pre-coagulation caustic dosing system replacement Paynter Dixon was engaged as a specialist supplier as they had been awarded the contract for the Mt Crosby Chemical System Upgrade and as they had the ability to provide the service at a reduced cost. Seqwater provided a cost estimate for the works, including quantities and unit rates, that estimated the cost of the works at $ 756,788. This estimate included 20% for project management, 10% for miscellaneous costs and 25% for engineering contingency. The estimate to complete the works under the existing contract as a variation was $ 416,076, and was accepted by Seqwater. No additional overhead costs for project management, miscellaneous costs and engineering contingency were required to be applied by combining the work within the existing contract.

- **Table 145 Project cost breakdown**

	Cost ($)	Percentage (%)*
Contract sum	3,300,000	
Contract contingency	495,000	15 (of contract sum)
Contract Total	**3,795,000**	
Project Contingency	210,000	6 (of contract sum)
Project management	495,000	15 (of contract sum)
Original Total	**4,500,00**	
Pre-coagulation caustic dosing system replacement	416,076	
Total	**4,916,076**	

Source*: Mt Crosby Chemical Systems Upgrade: Board meeting paper contract for approval* (Seqwater, 6 May 2011); *Mt Crosby Chemical Systems Upgrade – Eastbank Caustic Dosing Systems: Board meeting paper contract for approval*, Seqwater, 15 June 2011

The contract contingency ($ 495,000) and project contingency ($ 210,000) are considered to be for the same purpose. This in effect is a 21% contingency, which is beyond industry standards.

The *Variation Price Request Register: Mt Crosby East & Westbank WTP – Chemical Dosing System Upgrade* submitted to Seqwater by Paynter Dixon indicates that the total projected contract value will be approximately $ 4.3 million. Seqwater have not provided any information in relation to price variation requests which are yet to be approved.

The initial project cost estimate of $ 1 million provided in the 2011/12 review is lower than subsequent cost estimates of $ 2.1 million ± 30% and final approved cost of $ 3.63 million. Although the $ 2.1 million estimate is listed in the business case dated September 2010, it appears to have not been considered in the 2011/12 review. Justification of the difference between the 2011/12 and 2012/13 cost estimates has not been provided, although it is considered that the 2011/12 estimate was not formed well and is more likely a high level estimation rather than a calculated estimate.

8.4.6. Policy and procedures

Seqwater appear to have followed their procurement process for the engagement of Paynter Dixon for the Mt Crosby Chemical System Upgrade. Seqwater gained approval from the Seqwater Procurement Committee to waiver the procurement requirement of: *"purchases above $100,000 require a tender. According to the Policy, the CEO may waive this requirement where: specialised advice or services are sought and there is a recognised specialist, genuine urgent or emergent circumstances exist, or* *genuine sole supplier situation exists."* to engage Paynter Dixon to conduct the Pre-coagulation caustic dosing system replacement work without going to tender.

8.4.7. Timing and deliverability

The *Business Case – Large Projects: Mt Crosby Chemical Systems Upgrade* set out the project program as follows in **Table 146**.

- **Table 146 Project program**

Activity	Completion Date
Prepare Project and Procurement Plans	October 2010
Finalise all required tender documents	November 2010
Advertise tender as a D&C contract	December, 2010
Tender process and tender evaluation	February, 2011
Contract award	March, 2011
Project delivery which includes project management, technical project support including design reviews, construction supervision, training, commissioning etc.	End September, 2011
Final commissioning and Handover	October, 2011

Source: *Business Case – Large Projects: Mt Crosby Chemical Systems Upgrade*, Version 4, Seqwater, September 2010

The *Mt Crosby Chemical Systems Upgrade: Board meeting paper contract for approval* identifies the following risks associated with the project:

- *"Risk 1: Late delivery of the project*

  The original business case recommended that this project should be completed before the 2011-12 wet season. However, tender response schedules indicate that practical completion will not be achieved until March 2012 if contracts are finalised in May 2011. Consequently, there remains a risk that Mt Crosby plants will not be able to meet required water quality standards over the 2011-12 wet season. This risk is mitigated in the following ways:

  Turbidity

  - *The existing polymer dosing system will be retained until the new system is fully commissioned.*
  - *If the existing system is unable to manage high turbidity events, plant throughput will be limited requiring water demand to be managed through the SEQ Water Grid Manager by drawing from alternative sources.*

  Manganese

  - *Temporary chemical dosing systems have been put in place to provide interim risk mitigation. These systems will be retained until the new system is fully commissioned.*
  - *Management actions, such as flushing the Brisbane River by releasing water from Wivenhoe Dam, may be taken to reduce manganese levels in the raw water.*
  - *Even if residual manganese levels exceed reportable levels, it is highly unlikely that levels will exceed ADWG limits.*

Late delivery will increase the likelihood of Seqwater being unable to meet its contractual and regulatory requirements.

- *Risk 2: Construction delays*

  The Mt Crosby WTPs supply about 50% of the water supplied to the grid and are therefore critical WTPs. If the plants are not available to produce water, particularly during periods of highly turbid raw water when the plant capacity is already reduced, the plants will not be able to be shut down for construction activities. Plant shut-downs are also very weather dependent. Constraints on shut-downs may impact the construction activities and have schedule and budget implications.

- *Risk 3: Cost over-runs*

  Cost increases are possible because the site is a Brownfield site with many unknowns. For this reason, a 15% contract contingency is recommended."

Seqwater have not advised the current progress of the project.

8.4.8. Efficiency gains

Seqwater has identified that there was an opportunity to achieve a significant cost saving, approximately 50%, by adding the Mt Crosby Eastbank Caustic Dosing System Replacement to package the works already awarded to a contractor for the Mt Crosby Chemical Dosing System Upgrade. Seqwater suggested that delivering the project as stand-alone would cost approximately $ 800,000 where as if included in the current contract with Paynter Dixon it would only cost approximately $ 400,000. In the *Mt Crosby Chemical Systems Upgrade – Eastbank Caustic Dosing Systems: Board meeting paper contract for approval* (Seqwater, 15 June 2011) Seqwater suggest that this is due to:

> *"Paynter Dixon is able to complete the caustic dosing system replacement at a significant cost saving to Seqwater because they would save the following costs and overheads:*
>
> 1) *mobilisation costs*
> 2) *civil works for the construction of a second chemical bund*
> 3) *rework of control hardware installation (PLC, remote I.O racks, etc), and*
> 4) *rework of control logic.*
>
> *Further, there would be:*
>
> 1) *no additional direct cost for project management from the contractor*
> 2) *no further disruption to operations for installation and commissioning*
> 3) *no additional indirect Seqwater costs such as procurement and administration, and*
> 4) *better integration of the caustic dosing system with other systems that are included in the contracted scope of work."*

A benefit realisation plan should be implemented to measure the success of the works.

8.4.9. Allocation of overhead costs

A contract contingency of 15% was applied to the original contract sum awarded to Paytner Dixon. In addition to this, Seqwater included 6% for project contingency and 13% for project management. Seqwater has advised that the contract contingency was not increased when the variation was adopted.

8.4.10. Summary

The prudency of the project has not been assessed as it is required.

The project is assessed as efficient as the scope is appropriate, the standards of works are consistent with industry practice and the costs are consistent with prevailing market conditions.

The contract contingency ($ 495,000) and project contingency ($ 210,000) are considered to be for the same purpose. This in effect is a 21% contingency, which is beyond industry standards for a project at this stage. As the actual expenditure is entered into the RAB, the overly generous allocation of contingency should not carry through.

The value of expenditure not considered efficient: Nil.

The quality of the information provided on this project is outlined below in **Table 147**.

- **Table 147 Quality of information provided**

Section of Capex review	Mt Crosby Water Treatment Plant Water Quality Improvement		
Project description			
Provided documentation			
Prudency	Not required		
Cost driver	Not required		
Decision making process	Not required		
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

8.5. North Pine Water Treatment Plant Filter Upgrade

8.5.1. Proposed capital expenditure

Table 148 shows the Authority approved 2011/12 cost of the North Pine Water Treatment Plant filter upgrade project within the 2011/12 budget compared to the estimated actual value.

- **Table 148 North Pine Water Treatment Plant filter upgrade project – change in 2011/12 capital expenditure**

Source	2011/12 Costs ($000s)			
	QCA approved value	Estimated actual value	Difference	% increase
A7 2012-2013 GSC Information Return Capex 2011-12.xlsx	1,800	2,551	751	42

As can be seen in **Table 148**, the estimated actual 2011/12 expenditure is approximately $751, 000 or 42% greater than the value approved by the Authority.

It should be noted SKM were commissioned to undertake design modifications and tender and construction support for the North Pine Water Treatment Plant Filter Refurbishment project. To avoid a conflict of interest in the review of this project, the staff utilised were generally from New Zealand, were not involved in the original work and there was no communication with staff involved in the work. Also only an efficiency assessment was undertaken so there was no requirement to review the logic of need of the project.

8.5.2. Project description

The North Pine Water Treatment Plant was constructed in 1970 and is the region's second largest water treatment plant with a capacity of 250 ML/d. North Pine Water Treatment Plant was connected to the SEQ Water Grid in 2008.

The North Pine Water Treatment Plant filtration system has been assessed as requiring an upgrade due to the decreasing reliability of the existing assets.

The *North Pine Filter upgrade WTP* document, hereafter called the Business Case, outlines the following issues with the existing assets for the project:

- *"Filter under drain system* - *key components have asbestos cement piping and have a history of failure resulting in filter shut down for repairs impacting in capacity and water quality as well as OH&S issues.*
- *Filter media – the sand, which filters impurities, is beyond its useful life as it is over 20 years old resulting in operational inefficiencies and potential turbidity water quality excursions.*
- *Filter Washing system – newer technologies provide a superior filter clean resulting in better water quality with greater operational efficiency."*

8.5.3. Provided documentation

The key reference documents provided for this review are:

- *A7 2012-2013 GSC Information Return Capex 2011-12.xlsm*, Seqwater, February 2012
- *North Pine filter upgrade Capex RFI Response*, Seqwater, 24 September 2010
- *North Pine Filter upgrade WTP*, Seqwater, 14 March 2012

It should be noted that *North Pine filter upgrade Capex RFI Response*, hereafter called the RFI Response, contains no explanation of the cost increase and that the Business Case pre-dates the previous review (2011/12) and hence contains no new details.

Additionally, the following documents were previously submitted and have been used for this review:

- *Correspondence between SEQWGM and Seqwater*, SEQ Water Grid Manager, 28 January 2011
- *Project Management Plan*, Seqwater, 11 October 2010

8.5.4. Prudency

According to the terms of reference when assessing items for the prudency and efficiency of 2011/12 estimated actual capital expenditure:

> *"The consultant must assess the prudency and efficiency of 2011-12 non-drought*[7] *capital expenditure for each GSP that:*
>
> *a) was not submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*
>
> *b) is material, where materiality is defined as exceeding $2 million;*
>
> *The consultant must also assess the efficiency only of the 2011-12 non-drought capital expenditure for each GSP that:*
>
> *a) was submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*
>
> *b) differs significantly (more than 30%) from the forecast costs submitted by the GSP during the 2011-12 investigation."*

Consequently, a prudency assessment is not required.

8.5.5. Efficiency

The scope of works

The scope of works is defined in the Business Case as:

> *"Included in the scope of this project are detailed design, supply, installation and commissioning of:*
>
> - *filter floor system*
> - *filter media materials*
> - *increase in filter trough*
> - *filter wall treatment and sealing*

[7] Non-drought capital expenditure refers to capital expenditure that was not required as part of the Water Regulation 2002 or the Regional Water Security Program. As a consequence, it excludes many of the largest capital expenditure projects undertaken by the GSPs, such as the Hinze Dam raising or the Northern Pipeline Interconnector Stage 2.

- *backwash system including the blowers and air system*
- *associated mechanical and electrical systems*
- *control system and integration with existing systems*
- *commissioning*
- *operator training and maintenance scheduling*
- *removal and safe disposal of unwanted materials (some asbestos components)"*

Further details of these scope items have not been provided.

The Business Case contains details of the options assessment for the project that includes a quantitative assessment of the various options. This assessment considered the following parameters:

- Technical viability
- Compliance requirement
- Cost
- Timing

Standards of works

The standards of works adopted for this project have not been specified in documentation received to date.

Project cost

No details have been provided to explain the cost increase.

8.5.6. Policy and procedures

Review of the project delivery capability was assessed by Seqwater for the following options:

- Design, then construct
- Design and Construct (D&C)

The Business Case recommended that the project be delivered as a D&C type contract, due to the following advantages:

- Competitive tender
- Innovation process
- Single tender process, when compared to design, then construct
- Fixed price

No details have been received that confirm if this is the delivery method.

8.5.7. Timing and deliverability

No details of the project's program or the current status of the project have not been provided.

8.5.8. Efficiency gains

The following potential efficiencies have been outlined by Seqwater with respect to the North Pine Water Treatment Plant Filter Upgrade:

- Ability to provide a resilient supply for the SEQ Water Grid, due to improved operational efficiency and reliability
- Potential decrease in the volumes of backwash water required due to a reduction in the frequency of backwashes and the addition of air scouring. This would also lead to a decrease in the volumes of dirty backwash water required to be treated or disposed of
- Improved operator conditions, preventing potential future Workplace, Health and Safety incidents due to plant shutdown and repairs due to pipe failure (asbestos concrete pipe)
- Increase in production capacity – Due to fewer shutdowns of the plant due to unplanned maintenance

8.5.9. Allocation of overhead costs

No information has been provided on allocation of overheads.

8.5.10. Summary

A prudency assessment of the project is not required.

Insufficient information has been provided to allow an assessment of efficiency, nor has information been provided to explain why the cost increase has occurred. Additionally no details have been received that confirm the delivery method, the tender process, the current status of the project's program or the standards of work.

The value of expenditure considered to be efficient is outlined below in **Table 149**. This is the value approved in 2011/12 only.

Table 149 North Pine Water Treatment Plant Filter Project - revised capital expenditure profile

Project	Costs ($000s)
	2011/12
North Pine Water Treatment Plant Filter Upgrade	1,800

Additional details that may allow the review to be completed are as follows:

- An explanation of the cost increase
- The project Cost Plan
- Tender process and review
- The project program
- Confirmation of the standard of works

The adequacy of the information provided on this project is outlined below in **Table 150**.

- **Table 150 Adequacy of information provided**

Section of Capex review	North Pine Water Treatment Plant Filter Upgrade		
Project description			
Provided documentation			
Prudency			
Cost driver	Not required		
Decision making process	Not required		
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

8.6. Mt Crosby Eastbank Water Treatment Plant High Voltage Renewals

8.6.1. Proposed capital expenditure

Table 151 shows the Queensland Competition Authority approved 2011/12 cost of the Mt Crosby high voltage upgrade within the 2011/12 budget compared to the estimated actual value.

- **Table 151 Mt Crosby high voltage upgrade – change in 2011/12 capital expenditure**

Source	2011/12 Costs ($000s)			
	QCA approved value	Estimated actual value	Difference	% increase
A7 2012-2013 GSC Information Return Capex 2011-12.xlsx	690	1,374	684	99

As can be seen in **Table 151**, the estimated actual 2011/2012 expenditure is $ 1,370,000 or 99% greater than the value approved by the Queensland Competition Authority.

8.6.2. Project description

Mt Crosby East Water Treatment Plant was constructed in 1892 and is one of two major sources that supply water to Brisbane with a design capacity of treating up to 700ML per day. High voltage upgrade works have been flagged as a necessary upgrade for the plant to ensure that it can remain operational as it is a key part of the water network infrastructure.

A recent condition assessment of bulk water assets outlined that *"Most of the electrical equipment is in good condition for their age and appear to be well maintained except for some components of the HV equipment."*

The Mt Crosby high voltage upgrade project consists of replacing areas of the high voltage electrical installation to improve reliability, serviceability and safety for electrical operations. In late 2009, Seqwater engaged Parson Brinkerhoff to undertake an options report to review the adequacy of the present site electrical installation, investigate modern practises and assess availability, performance and cost of replacement equipment in order to:

- Improve operational flexibility and safety of personnel by replacing the existing oil insulated switchgear with modern air or vacuum type switchgear
- Remove the presence of any insulating oil from the site and thereby remove the risk of contamination to water supplies from spills etc
- Improve the life of the works and long term system reliability. New equipment will be more reliable than older well used equipment
- Improve operational flexibility by allowing switching to be undertaken safely by installation of modern switchgear
- Minimise high voltage maintenance requirements and associated system outages

8.6.3. Provided documentation

The key reference documents used for this review are:

- *A7 2012-2013 GSC Information Return Capex 2011-12.xlsm*, Seqwater, February 2012
- *Mt Crosby HV Upgrade Project Evaluation Plan*, Seqwater, June 2011
- *Condition Assessment of Bulk Water Assets*, Seqwater, November 2007
- *Mt Crosby HV Upgrade Project Contract signed*, Seqwater, No Date
- *Mt Crosby Eastbank WTP Cost Plan HV Upgrade.xls*, Seqwater, No Date
- *Facility Asset Management Plan – Eastbank WTP*, Seqwater, June 2011
- *Mt Crosby HV Upgrade Project Sourcing Strategy*, Seqwater, May 2011
- *Mt Crosby HV Upgrade – Project Management Plan*, Seqwater, March 2011
- *Mt Crosby HV Risk Assessment*, Seqwater, May 2011
- *Mt Crosby HV Upgrade Project Status Report*, Seqwater, February 2012

8.6.4. Prudency

According to the terms of reference when assessing items for the prudency and efficiency of 2011/12 estimated actual capital expenditure:

> *"The consultant must assess the prudency and efficiency of 2011-12 non-drought[8] capital expenditure for each GSP that:*

---

[8] Non-drought capital expenditure refers to capital expenditure that was not required as part of the Water Regulation 2002 or the Regional Water Security Program. As a consequence, it excludes many of the largest capital expenditure projects undertaken by the GSPs, such as the Hinze Dam raising or the Northern Pipeline Interconnector Stage 2.

a) was not submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and

b) is material, where materiality is defined as exceeding $2 million;

The consultant must also assess the efficiency only of the 2011-12 non-drought capital expenditure for each GSP that:

a) was submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and

b) differs significantly (more than 30%) from the forecast costs submitted by the GSP during the 2011-12 investigation."

Consequently an assessment of prudency is not required.

Notwithstanding the above, the following notes regarding the driver and decision making progress are made.

Cost driver

The cost driver nominated by Seqwater for this overall project is *reliability*. Seqwater also suggest that benefits for health and safety, and the environment are also important cost drivers.

The Mt Crosby Eastbank Water Treatment Plant HV Sourcing Strategy states that '*the age and configuration of the existing equipment is such that any equipment failures will lead to an outage of electrical supply to the entire treatment plant*'. The information supports *renewal* as the cost driver for the project.

Decision making process

A criticality and condition assessment was conducted in order to determine the necessary works required. The results of the condition assessment site inspection concluded that the Eastbank Water Treatment Plant was in fair condition with 33% of assets requiring refurbishment or replacement. Mt Crosby Eastbank Water Treatment Plant's High voltage electrics were highlighted as a necessary expenditure to ensure plant reliability.

The primary driver of *renewal* has been demonstrated.

8.6.5. Efficiency

The scope of works

The scope of works outlined in the sourcing strategy is as follows:

- Replacement of high voltage distribution switchboard and switch rooms
- Chemical area transformers
- Sludge area transformers
- Holts Hill feeder cabling
- General works inclusive of testing and inspection services

- Documentation and communication regarding equipment and completed works

Standards of works

The standard of works appears to be consistent with industry practice.

Project cost

The project cost for the high voltage project has been reviewed. The Authority had approved $ 690,000 for works to be completed for the financial year 2011/12. The summarised expenditure profile is included in **Table 152** below. It can be seen that there is a significant increase in expenses for the financial year 2011/12 with a 77% increase on the original budget.

- **Table 152 High Voltage Project Variances**

	2010/11	2011/12	2012/13
Project Management Plan	$ 20,000	$ 780,800	$ 16,940
A7 2012-2013 GSC Information Return Capex 2011-12.xlsx	-	$ 1,379,824	-
% Increase	-	77%	-

Seqwater states in their sourcing strategy documentation May 2011:

"The project budget will be updated after tenders are received and evaluated"

The Mt Crosby High Voltage Upgrade Project Sourcing Strategy states that the Seqwater will seek tender offers from the market through a 'design and construct' contract. Tenders will be evaluated on the '*criteria, strategies, method and schedule of the evaluation of tenders*' as outlined in the Mt Crosby Evaluation Plan and shown in **Table 153**.

- **Table 153 Mt Crosby High Voltage upgrade tender evaluation criteria**

#	Criteria	Non-Price Weightings	Total Weightings
EC1	Bid price**		40%**
Non-price criteria			
EC2	Knowledge and appreciation of the project	10%	6%
EC3	Approach and methodology	15%	9%
EC4	Key personnel	15%	9%
EC5	Technical capability	15%	9%
EC6	Org structure and financial capability	5%	3%
EC7	Safety and environmental record and plan	15%	9%
EC8	Certainty	10%	6%
EC9	Reference projects	15%	9%
Sub-total (non-price)		100%	60%**
Total (price + non-price)			100%

The tender review report has not been provided.

It is considered that the increase in costs is most likely justified as a result of an underestimate of the original cost estimate relative to high tender prices within the market. However, another possible explanation for the large variance in budget costs could be due to a change in scope. Sufficient information was not available to determine whether a change in scope contributed to the increase in expenditure.

The provision of the pre contract scope from the tender review and the completed scope of works will allow a continuous audit trail to be documented and assessed.

Information contained within the February 2012 Project Status Report indicates forecast contract expenditure for 2011/12 is $ 1,407,000 and for 2012/12 forecast expenditure is $ 60,000.

8.6.6. Policy and procedures

The information provided is consistent with Seqwater's policies and procedures.

8.6.7. Timing and deliverability

The Mt Crosby Eastbank Water Treatment Plant HV Sourcing Strategy states that the delivery and installation time of the project should take approximately 30 weeks. The revised cash flow contained in the cost plan indicates that the project is due for completion by the end of the 2011/12 financial year, however the February 2012 Project Status Report has an 'amber' status indicator for timeframe. The Project Status Report states the '*delivery of the HV switches are delayed but with a change in the installation procedure this should not impact the practical completion date*'.

It is assessed that project is able to be delivered within the 2011/12 financial year.

8.6.8. Efficiency gains

No efficiency gains have been outlined by Seqwater for the completion of this project.

8.6.9. Allocation of overhead costs

Overhead costs have been applied to the HV electrical upgrade at approximately 10% of the overall project value. The overheads which have been applied to this project are reasonable.

8.6.10. Summary

An assessment of prudency for the Mt Crosby high voltage upgrade project is not required.

An assessment of the efficiency of the project cannot be completed until additional information regarding the post contract scope has been provided.

The value of expenditure considered to be efficient is the original 2011/12 budget and is outlined below in **Table 154**.

Table 154 Mt Crosby HV upgrade - revised capital expenditure profile

Project	Costs ($000s)
	2011/12
Mt Crosby HV upgrade	690

It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information should include:

- The Pre-contract scope of works
- The tender reviews
- The post contract scope of work

The adequacy of the information provided on this project is outlined below in **Table 64**.

Table 155 Adequacy of information provided

Section of Capex review	Mt Crosby High Voltage Upgrade		
Project description			
Provided documentation			
Prudency			
Cost driver	Not required		
Decision making process	Not required		
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

8.7. North Pine Water Treatment Plant Fluoride Dosing Point Relocation

8.7.1. Proposed capital expenditure

Table 156 shows the Authority approved 2011/12 cost of the North Pine Water Treatment Plant Fluoride Dosing Point Relocation within the 2011/12 budget compared to the estimated actual value.

- **Table 156 North Pine Water Treatment Plant Fluoride Dosing Point Relocation – change in 2011/12 capital expenditure**

Source	2011/12 Costs ($000s)			
	QCA approved value	Estimated actual value	Difference	% increase
A7 2012-2013 GSC Information Return Capex 2011-12.xlsx	435	1,048	613	141

As can be seen in **Table 156**, the estimated actual 2011/12 expenditure is approximately $ 613,000 or 141% greater than the value approved by the Authority.

It should be noted SKM were commissioned to undertake the options investigation, concept design, detailed design and tender and construction support for the North Pine Water Treatment Plant Fluoride Dosing Relocation project. To avoid a conflict of interest in the review of this project the staff utilised were generally from New Zealand, and were not involved in the original work and there was no communication with staff involved in the work. Also only an efficiency assessment was undertaken so there was no requirement to review the logic of need of the project.

8.7.2. Project description

Seqwater has adopted a design principle of dosing fluoride upstream of a treated water storage to maximise mixing and retention time, to reduce the risks of supplying water with elevated levels of fluoride. The North Pine Water Treatment Plant dosing point was located downstream of the treated water storages. Consistent with the above principle, Seqwater undertook an investigation as to whether the existing fluoride dosing point at North Pine could be relocated to an alternative position to reduce the risk of supplying water with elevated levels of fluoride.

A total of 13 dosing location options were identified. The options were evaluated by means of a Multi Criteria Analysis with the key evaluation criteria being:

- Interference risk between fluoride and other water treatment chemicals
- The degree of protection provided against fluoride over/under dosing
- Other incidental benefits to the water treatment processes at the plant
- Capital and ongoing costs (NPV analysis)

The preferred option was to relocate the dosing point between the filters and the treated water storages, and to retain the existing lime dosing system (also downstream of the filters). The existing fluoride analyser located downstream of the treated water storages was retained as the final indication and record of fluoride levels leaving the North Pine Water Treatment Plant.

This strategy means that fluoride dosing occurs upstream of the major treated water storages and any fluctuations in fluoride concentration levels will be attenuated by the storage. The inclusion of two fluoride analysers, one upstream and one downstream of the treated water storages, allows dose control and safe operations of the system. The strategy is regarded as industry “best practice” and is consistent with the general approach being adopted for other Seqwater fluoride dosing facilities.

8.7.3. Provided documentation

The key reference documents used for this review are:

- *A7 2012-2013 GSC Information Return Capex 2011-12.xlsm*, Seqwater, February 2012
- *Fluoride Improvement Project business paper*, Seqwater, 16 December 2009
- *North Pine Water Treatment Plant Fluoride Dosing Relocation Design Report*, Sinclair Knight Merz, Revision C, 4 May 2010
- *North Pine WTP Fluoride Dosing Relocation – Detailed Design project brief*, Seqwater, 2 March 2010

8.7.4. Prudency

According to the terms of reference when assessing items 2011/12 estimated actual capital expenditure:

> *"The consultant must assess the prudency and efficiency of 2011-12 non-drought*[9] *capital expenditure for each GSP that:*
>
> *a) was not submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*
>
> *b) is material, where materiality is defined as exceeding $2 million;*
>
> *The consultant must also assess the efficiency only of the 2011-12 non-drought capital expenditure for each GSP that:*
>
> *a) was submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*
>
> *b) differs significantly (more than 30%) from the forecast costs submitted by the GSP during the 2011-12 investigation."*

As this project was submitted as part of last year's review, an assessment of prudency is not required.

8.7.5. Efficiency

The scope of works

The scope of works is described in the project brief as:

- Diversion of the existing fluoride dosing pipeline and installation of a new fluoride dosing point in the existing DN1650 pipeline between the filters and the treated water storages, and associated access pit (if required)
- Installation of a DN1650 full bore electromagnetic flowmeter and pit between the filters and the treated water storages

[9] Non-drought capital expenditure refers to capital expenditure that was not required as part of the Water Regulation 2002 or the Regional Water Security Program. As a consequence, it excludes many of the largest capital expenditure projects undertaken by the GSPs, such as the Hinze Dam raising or the Northern Pipeline Interconnector Stage 2.

- Removal of existing tee in DN1650 filtered water main and re-routing of DN300 washwater main to the treated water storages
- Installation of a new in-line fluoride analyser, utilising the existing sample lines located in the valve pits at the inlets to the two treated water storages. A suitable location for the on-line analyser shall be determined, with the objective of minimising lag time between the sample point and measurement, along with sample line modifications. The new flowmeter and on-line analyser will be the primary control devices for fluoride dosing.
- TISAB waste disposal system associated with on-line fluoride analyser
- Replacement of five (5) existing Dall flowmeters with new DN750 full bore electromagnetic flowmeters on the outlet pipelines from the filters, providing secondary flow indication for the fluoride control system
- Air release points in five (5) existing Dall flowmeter pits and on filtered discharge pipelines as required
- Installation of four actuators for existing DN1200 butterfly valves on the inlets and outlets of the two treated water storages;
- Electrical power and communications cabling
- Changes to the existing control system and SCADA interface associated with new dosing location, new primary flowmeter, new secondary flowmeters, actuated inlet /outlet valves to treated water storages, and operation of both pre and post storage on-line fluoride analysers.

Standards of works

Seqwater's Detailed Design brief (March 2010) specifies that the design will comply with the Fluoride Code of Practice, relevant Australian Standards and WSAA Standards.

Project cost

In last year's submission to the Authority, Seqwater proposed a budget of $ 435,000 for the 2011/12 financial year. This year's estimate of the actual spend in 2011/12 is $ 1,048,000 – an increase of $ 613,000, or 141%. Seqwater has not advised the reason for this variance to date. Seqwater has forecast capital costs of $ 55,000 for the 2012/13 financial year, with no subsequent capital expenditure.

A maximum capital cost of $ 1,300,000, including contingency of 30%, was recommended to the Board in December 2009.

The construction cost estimate from the Design Report (SKM, May 2011) is $ 831,922. SKM noted that the estimate was produced with an accuracy of ± 25% and was inclusive of a 20% contingency.

Considering the costing accuracy, the project could cost up to $ 1,039,000 (1.25 x $ 831,922). This cost is comparable to the expenditure of $ 1,048,000 detailed in *A7 2012-2013 GSC Information Return Capex 2011-12* excel spreadsheet.

8.7.6. Policy and procedures

Seqwater appears to have followed their procurement procedures in tendering the works for this project.

8.7.7. Timing and deliverability

No information has been provided for the project; consequently an assessment of deliverability is not possible.

8.7.8. Efficiency gains

No efficiency gains have been identified for this project.

8.7.9. Allocation of overhead costs

The SKM construction cost estimate included a contingency of 20%.

8.7.10. Summary

As this project was submitted as part of last year's review an assessment of prudency is not required.

The price submitted for the expenditure in 2011/12 is assessed to be efficient as it is comparable to the estimate on the Design Report. The scope is considered to be appropriate and the standard of works is consistent with industry practice.

Without information regarding the status of the project, an assessment as to whether it will be completed by 30/6/2012 cannot be made. If the works are not commissioned by 30/6/2012, the amount cannot be entered into the RAB. This information should be provided.

The value of expenditure not considered to be efficient: Nil.

The adequacy of the information provided on this project is outlined below in **Table 157**.

- **Table 157 Adequacy of information provided**

Section of Capex review	North Pine Water Treatment Plant Fluoride Dosing Point Relocation
Project description	
Provided documentation	
Prudency	
Cost driver	Not required
Decision making process	Not required
Efficiency	
Scope of works	
Standards of work	
Project cost	
Policy and procedures	
Timing and deliverability	
Efficiency gains	

Section of Capex review	North Pine Water Treatment Plant Fluoride Dosing Point Relocation		
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

8.8. Mt Crosby Westbank Water Treatment Plant Renewals

8.8.1. Proposed capital expenditure

Table 158 shows the Queensland Competition Authority approved 2011/12 budget for the Mt Crosby Westbank Water Treatment Plant renewals compared to the estimated actual value.

- **Table 158 Mt Crosby Westbank Water Treatment Plant renewals – change in 2011/12 capital expenditure**

Source	2011/12 Costs ($000s)			
	QCA approved value	Estimated actual value	Difference	% increase
A7 2012-2013 GSC Information Return Capex 2011-12.xlsx	384	814	430	112

From **Table 158** above, the estimated actual 2011/12 expenditure is $ 430, 000 or 112% greater than the value approved by the Authority during the Grid Service Charges Review 2011/12.

8.8.2. Project description

Mt Crosby Westbank Water Treatment Plant was commissioned in 1985 and treats raw water from Mt Crosby Weir, to potable water standard. The design treatment capacity is 250 ML/day and consists of two 125 ML/day process streams. The water treatment plant was constructed in a single stage with provision for future expansion built into the raw water pump station and the treated water pump station. Most of Mt Crosby Westbank Water Treatment Plants production is during high demand months and during maintenance shutdowns of the Mt Crosby Eastbank Water Treatment Plant. The water treatment plant produces 250 ML/day, 125 ML/day or 0 ML/day; as there is not much flexibility to produce flows between these flow rates.

The original scope of the Mt Crosby Water Treatment Plant renewals made allowance for $ 383,500 of work to be undertaken that included new valves and pipework. Since the Authority has approved the cost during the Grid Service Charges 2011/12, Seqwater has identified additional items that require renewal or replacement. The items identified by Seqwater are two Clearwater pumps (12 and 13) which have been identified as requiring refurbishment as they have been in operation for 25 years with no major overhaul and the refurbishment of Raw Water Pump 5. The three additional items have been estimated to cost $ 385,800. Seqwater has indicated that the raw water isolation valves will have to be replaced before work on Raw Water Pump 5 can commence and therefore the refurbishment of Raw Water Pump 5 is on hold and is now not expected to be completed within 2011/12.

8.8.3. Provided documentation

The key reference documents used for this review are:

- *A7 2012-2013 GSC Information Return Capex 2011-12.xlsm*, Seqwater, February 2012
- *Facility Asset Management Plan – Mt Crosby Westbank WTP*, Seqwater, June 2011
- *SOW - Mt Crosby Westbank Plant – Clearwater Pump 13 swing check and main isolation valve replacement*, Seqwater, no date
- *Internal memo re Clearwater Pump 13 Swing Check and Main Isolation Valve Replacement*, Seqwater, 6 January 2011
- *SOW - Replace 10 filter rate control valves*, Seqwater, August 2011
- *SOW – Mt Crosby Westbank WTP DAF recycle pumps discharge pipework replacement*, Seqwater, no date
- *SOW Mt Crosby Westbank basin inlet valves*, Seqwater, no date
- *Information Request Response for Mt Crosby Westbank WTP Renewals RFI ID No. 0014*, Seqwater, 13 March 2012
- *Information Request Response for Mt Crosby Westbank WTP Renewals*, Seqwater, 22 March 2012

8.8.4. Prudency

According to the terms of reference when assessing items for the prudency and efficiency of 2011/12 estimated actual capital expenditure:

> *"The consultant must assess the prudency and efficiency of 2011-12 non-drought[10] capital expenditure for each GSP that:*
>
> *a) was not submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*
>
> *b) is material, where materiality is defined as exceeding $2 million;*
>
> *The consultant must also assess the efficiency only of the 2011-12 non-drought capital expenditure for each GSP that:*
>
> *a) was submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*
>
> *b) differs significantly (more than 30%) from the forecast costs submitted by the GSP during the 2011-12 investigation."*

Consequently an assessment of prudency is not required.

---

[10] Non-drought capital expenditure refers to capital expenditure that was not required as part of the Water Regulation 2002 or the Regional Water Security Program. As a consequence, it excludes many of the largest capital expenditure projects undertaken by the GSPs, such as the Hinze Dam raising or the Northern Pipeline Interconnector Stage 2.

8.8.5. Efficiency

The scope of works

The scope of work that was included within the Grid Service Charges Review 2011/12 is shown within **Table 159** below, Items 1 to 4. Seqwater has indicated that an additional three items have been added to the scope of works, items 5 to 7.

Table 159 Breakdown of changes in scope of works and 2011/12 capital expenditure

ID	Scope item	Original estimated cost ($)	Estimated actual cost ($)	Item status
1	TWB Ren: Pure Water Pump Check Valves	153,370	126,793	
2	DAF recycle pumps discharge pipe work replacement	59,630	51,240	
3	Basin Inlet Valves	26,000	30,000	
4	Filter Rate Control Valves	144,500	120,000	
	Subtotal A	**383,500**	**328,033**	
5	Clearwater Pump 12	New item	85,800	Under construction
6	Clearwater Pump 13	New item	100,000	With procurement
7	Raw Water Pump 5	New item	300,000	On hold
	Subtotal B		**485,800**	
	Total (Subtotal A + Subtotal B)	**383,500**	**813,833**	

Seqwater has stated that items 5, 6 and 7 in **Table 159**, above, are a result of asset failures and were not included in the original budget, submitted to and approved by the Authority as part of the Grid Service Charges Review 2011/12. From **Table 159** above, it can be seen that even with a cost saving of $ 55,667 for items 1 to 4 that the three additional items amount to an overall 112% increase on the approved expenditure. Seqwater has advised that Item 7 is on hold and is not expected to be completed within the 2011/12 and that it is likely to be included in future year's programs.

Item 1 Replacement of Clearwater pump 13 swing check and isolation butterfly valves

The scope of work for this item included:

- The swing check and isolation butterfly valves has been replaced by valves which perform at the same duty and at the same specification in terms of flow velocity and pressure rating as the original valves
- A new support bracket, bleed valves and a dismantling joint has been supplied and installed
- The value of the works was estimated at $ 150,000 and therefore in accordance with Seqwater procurement policy quotations were sought from 3 members of the Maintenance Services Standing Offer Panel for the completion of the work

Item 2 Replacement of the thin wall stainless steel discharge pipework above the DAF recycle pumps

The scope of work for this item included:

- The original stainless steel discharge pipework above the DAF recycle pumps was in very poor condition with large leaks which where preventing the operation of the pumps and the DAF system. Without the DAF system the plant was limited to producing only 125 ML/day. A repair of the leaks was attempted but proved unsuccessful due to the condition of the pipework
- The sections that where replaced with 304 stainless steel schedule 10 spiral welded pipe, an increase in wall thickness from the original pipework

Item 3 Replacement of the existing Rotork actuators on the basin inlet valves, including installation of remote operation

The scope of work for this item included:

- The basin inlet valves are used to isolate raw water supply into the basin for maintenance and inspections
- Originally the only way to operate the valves was be setting up a confined spaces entry permit, entering the valve pit and operating the valves. This procedure was time consuming, costly and was considered to be an avoidable risk
- The project consisted of the replacement of the original Rotork actuators and the installation of a remote operation station (lockable stainless steel cabinet) on top of the valve pits to eliminate the need for confined space entry

Item 4 Replacement of 10 flow control valve on the filters

The scope of work for this item included:

- The brand of the original flow control valves and actuators where no longer supported in Australia
- The original valves where old, some were leaking and their operation was erratic.
- Due to the brand of the valves not being supported, Seqwater found it difficult to source parts required for repairs and it is was therefore deemed by Seqwater to be more efficient to replace the valves with another brand that does have support
- Two of the valves were successfully replaced two years ago and the intent was to replace the remaining ten valves
- To fit the new valves, compensation rings to guarantee sealing were required, along with minor pipework modifications

Item 5 Refurbishment of Clearwater pump 12

The documentation provided by Seqwater states that this work was to be done from the operational expenditure budget. It is considered that this item is capital expenditure as opposed to operation expenditure.

The scope of works for this item includes:

- The Clearwater pump 12 has been in operation for 25 years with no major overhaul recorded for within this period and consequently has been identified by Seqwater to be overdue for refurbishment. A refurbishment will restore the pump to an as new condition with the implication that the pumps reliability will be improved
- Seqwater indicated that the refurbishment of the pump will allow the inlet and outlet pipe work concrete coating (internal) to be inspected and repaired should this be required.
- No11 clear water pump was refurbished last year and major repairs were required in the refurbishment
- Mt Crosby Westbank Water Treatment Plant is equipped with 6 treated water pumps that operate as a duty/standby arrangement depending on the production rate of the water treatment plant. The treated water pumps are used to pump water from the treated water tank to the main reservoirs on Camerons Hill. Should the treated water pumps not be maintained and a multi pump failure occur it would result in the inability to supply treated water

Item 6 Refurbishment of Clearwater pump 13

The details are the same as Clearwater Pump 12 the operational expenditure budget. It is considered that this is capital expenditure rather than operation expenditure.

Item 7 Refurbishment of Raw Water Pump 5

Seqwater has not provided SKM with sufficient information to determine the scope of works for this item. Seqwater has advised that Raw Water Pump number 5 is on hold and is that it is not expected to be completed within 2011/12 and that it is likely to be included in future year’s programs.

Standards of works

Items 1 to 4 Replacement of Clearwater pump 13 swing check and isolation butterfly valves

SKM has not evaluated the standards of works since the total expenditure for these items has not exceeded the value approved by the Authority within the Water Grid Service Charges 2011/12.

Item 5 and 6 Refurbishment of Clearwater pump 12 and 13

Seqwater has indicated that the refurbishment was required due to “asset reliability”. Seqwater has not provided a risk analysis to show the risk profile of the pump station and each individual pump. It is however considered prudent that a pump that has not undergone an overhaul within 25 years to be due for an overhaul/ refurbishment to limit the risk exposure.

Item 7 Refurbishment of Raw Water Pump 5

Seqwater has not presented sufficient information to allow as assessment of the standards of work

Project cost

Item 1 Replacement of Clearwater pump 13 swing check and isolation butterfly valves

Quotations were sought from three contractors that are listed on the Maintenance Services Standing Offer Panel; as presented in **Table 160** below.

- **Table 160 Contractors invited to quote**

Company	Lump sum price ($) (excl. GST)	% difference
Aquatec Services Pty. Ltd.	114,466.40	0
Heaton Plant and Pipeline	139,784.47	22.12
Westwater Enterprises	162,661.00	33.32

The quotation received from Aquatec Services Pty. Ltd. was deemed to offer Seqwater the best value for money however due to the large variation in prices submitted the tender price deliverable schedules were examined in order to ensure that all contractors were fully conversant with the scope of works involved, and their quotation contained allowances for the required equipment and services.

Seqwater identified that the major difference between the quotations received was in regards to item 3 "purchase of concrete lined pipework required for fitting of new valve". The prices submitted for item 3 ranged from $ 10,068.25 to $ 46,381.00 and therefore Seqwater requested from each of the companies to clarify their inclusions for item 3.

Seqwater undertook consultation with Aquatec Services Pty. Ltd in regards to the clarifying item 3. After examining the clarification submitted by Aquatec Services Pty. Ltd. Seqwater was satisfied that Aquatec Services Pty. Ltd. had a clear understanding of the requirements for item 3 in the tender price deliverable and therefore it was recommended to award the contract to Aquatec Services Pty. Ltd.

The project cost for this item have not been evaluated as the total expenditure for this item has not exceeded the value approved by the Authority within the Water Grid Service Charges 2011/12.

Item 2 Replacement of the thin wall stainless steel discharge pipework above the DAF recycle pumps

The project cost for this item have not been evaluated as the total expenditure for this item has not exceeded the value approved by the Authority within the Water Grid Service Charges 2011/12.

Item 3 Replacement of the existing Rotork actuators on the basin inlet valves, including installation of remote operation

The project cost for this item have not been evaluated as the total expenditure for this item has not exceeded the value approved by the Authority within the Water Grid Service Charges 2011/12.

Item 4 Replacement of 10 rate control valve on the filters

The project cost for this item have not been evaluated as the total expenditure for this item has not exceeded the value approved by the Authority within the Water Grid Service Charges 2011/12.

Item 5 Refurbishment of Clearwater Pump 12

Seqwater has provided a copy of the quote received from Aesseal Environmental Technology for the refurbishment of the Clearwater Pump 12 to the value of $ 28,960 (Excl. GST). A cost breakdown has been provided by Seqwater that is presented in **Table 161** below.

- **Table 161 Cost breakdown for Item 5**

Description	Cost ($)
Internal staff/ contractors cost	
Internal/ Maintenance Panel	12,800
Project management and supervision	5,000
Subtotal – Internal staff/ contractor cost	**17,800**
External staff/ contractor cost	
Pump refurbishment (Maintenance Panel)	32,000
Additional work as required, after internal assessment	20,000
Repair pipe internals	8,000
Subtotal – External staff/ contractor cost	**60,000**
Contingency (10% of Subtotal – Internal and External staff/ contractor cost)	8,000
Total Project Cost	**85,800**

From **Table 161** above it can be seen that the original budget did make an allowance of 30% for overheads and management cost. A 10% contingency is considered to be on the low side, however it is considered that budget play has been allowed for within the additional work that is required. Seqwater has stated that the valves at the pump will be replaced within the same project. The proposed cost for item 5 is assessed to be efficient

Item 6 Refurbishment of Clearwater pump 13

Seqwater has provided a copy of the quote received from Aesseal Environmental Technology for the refurbishment of the Clearwater Pump 12 to the value of $ 62,877 (Excl. GST). A cost breakdown has been provided by Seqwater that is presented in **Table 162** below.

- **Table 162 Cost breakdown for Item 6**

Description	Cost ($)
Internal staff/ contractors cost	
Internal/ Maintenance Panel	12,800
Project management and supervision	5,000
Subtotal – Internal staff/ contractor cost	**17,800**
External staff/ contractor cost	
Pump refurbishment (Maintenance Panel)	63,000
Additional work as required, after internal assessment	10,000
Repair pipe internals	5,000
Subtotal – External staff/ contractor cost	**78,000**
Contingency (5% of Subtotal – Internal and External staff/ contractor cost)	4,000
Total Project Cost	**99,800**

From **Table 162** above it can be seen that the original budget did make an allowance of 23% for overheads and management cost. A 5% contingency is considered to be on the low side and consider it not be sufficient to allow for any unplanned incidences. The proposed cost for item 5 is assessed to be efficient and recommend that Seqwater take a relook at the cost breakdown.

Item 7 Refurbishment of Raw Water Pump 5

Seqwater has advised that this project is on hold.

8.8.6. Policy and procedures

Seqwater has generally followed their policies and procedures in identifying the items and in procurement.

8.8.7. Timing and deliverability

Seqwater has stated that items 1 to 4 have been completed. The other three items will be discussed individually below.

Item 5 – Refurbishment of Clearwater Pump 12

Seqwater has provided a program of works for the refurbishment of Clearwater Pump 12 within the Project Management Plan. The program presented by Seqwater is shown below.

Phase/Task	From	To	Deliverable(s)
Isolate Pump Unit and dismantle	05.12.11	7.12.11	Isolated and dismantled
Transport to supplier	8.12.11	9.11.11	completed
Refurbish Pump unit	12.12.11	10.2.12	refurbished
Inspect and refurbish internal pipe work	16.1.12	20.1.12	Inspected and refurbished
Transport pump to Seqwater	13.2.12	13.2.12	
Install pump unit and valves	14.2.12	16.2.12	Installed
Test, de-isolate and commission	17.2.12	17.2.12	Commissioned

From the above program it can be seen that this program was compiled at the time of requesting quotes to undertake the work. Seqwater has not provided a more up to date program except stating that the work is in progress.

Seqwater has provided a risk register for the work to be undertaken.

Item 6 – Refurbishment of Clearwater Pump 13

Seqwater has provided a program of works for the refurbishment of Clearwater Pump 12 within the Project Management Plan. The program presented by Seqwater is shown below.

Phase/Task	From	To	Deliverable(s)
Isolate Pump Unit and dismantle	19.03.12	20.03.12	Isolated and dismantled
Transport to supplier	21.03.12	22.03.12	completed
Refurbish Pump unit	26.03.12	4.05.12	refurbished
Inspect and refurbish internal pipe work	26.03.12	4.05.12	Inspected and refurbished
Transport pump to Seqwater	7.05.12	8.05.12	
Install pump unit and valves	9.05.12	18.05.12	Installed
Test, de-isolate and commission	18.05.12		Commissioned

From the above program it can be seen that this program was compiled at the time of requesting quotes to undertake the work. Seqwater has not provided a more up to date program except stating that the quote received is with procurement.

Seqwater has provided a risk register for the work to be undertaken.

Item 7 – Refurbishment of Raw Water Pump 5

Seqwater has stated that the item has been placed on hold.

8.8.8. Efficiency gains

Seqwater has not stated any efficiency gains that are expected as a result of undertaking the seven items.

8.8.9. Allocation of overhead costs

- **Table 163 Allocation of overhead costs**

Overhead Costs	Item 4		Item 5	
	Cost ($)	% of Total Project Cost	Cost ($)	% of Total Project Cost
Internal/ Maintenance Panel	$ 12,800	14.9	$ 12,800	12.8
Project management and supervision	$ 5,000	5.8	$ 5,000	5.0
Contingency	$ 8,000	9.3	$ 4,000	4.0

These are assessed as reasonable.

8.8.10. Summary

The project has not been assessed for prudency in accordance with the terms of reference.

Items 5 and 6 have been assessed as efficient. Seqwater has advised that Item 7 is on hold and is not expected to be completed before 30/6/2012.

The value of expenditure considered efficient is outlined below in **Table 164**.

- **Table 164 Mt Crosby Water Treatment plant renewals - revised capital expenditure**

Project	Costs ($000s)
	2011/12
Item 7 – Refurbishment of Raw Water Pump 5	514

To provide a complete audit trail, the following information should be provided:

- Project status information

The adequacy of the information provided on this project is outlined below in **Table 165**.

- **Table 165 Adequacy of information provided**

Section of Capex review	Mt Crosby Westbank Water Treatment Plant renewals		
Project description			
Provided documentation			
Prudency			
Cost driver	Not required		
Decision making process	Not required		
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

8.9. Various Water Treatment Plant Chemical Dosing Improvements

8.9.1. Proposed capital expenditure

Table 166 shows the Authority approved 2011/12 cost of the total of various water treatment plant chemical dosing improvements within the 2011/12 budget compared to the estimated actual value.

- **Table 166 Various water treatment plant chemical dosing improvements – change in 2011/12 capital expenditure**

Source	2011/12 Costs ($000s)			
	QCA approved value	Estimated actual value	Difference	% increase
A7 2012-2013 GSC Information Return Capex 2011-12.xlsx	750	1,132	383	51

As can be seen in **Table 166**, the estimated actual 2011/12 expenditure is approximately $ 383, 000 or 51% greater than the value approved by the Authority.

8.9.2. Project description

The purpose of this project was to implement various chemical dosing improvements in two stages across South East Queensland. The improvements to the chemical dosing plants were to enable Seqwater to meet the regulatory[11] requirement of fluoridising public water supplies servicing a population of over 1,000 people. The Queensland Water Fluoridation Regulation (2008) Schedule 1 required Seqwater to have their fluoridation plants constructed and operational by:

- Stage 1 – 31 December 2008 – The Regulation required that all SEQ major water treatment plants be operation. The following Seqwater water treatment plants are considered to be major: Both Mt Crosby water treatment plants, North Pine, Landers Shute, Molendinar and Mudgeeraba
- Stage 2 – 31 December 2009 - The Regulation required that all SEQ minor water treatment plants be operation. Seqwater has indicated that 6 medium water treatment plants and 14 small water treatment plants were affected by the Regulation.

In May 2009 Seqwater advised Queensland Health that a water sample result for North Pine Water Treatment Plant resulted in a reading in excess of 1.5 mg/L standard set for fluoridated water. The review of this incident has resulted in a review of the final level of service requirement for Stage 1 and 2 water treatment plants.

The review of the level of services identified that the aggressive construction timetable that was adopted for the construction of the North Pine Water Treatment Plant fluoride dosing and the merging of Seqwater contributed to the higher than expected fluoride level.

This project was undertaken as a result of the investigation which highlighted deficiencies within the fluoridation program.

8.9.3. Provided documentation

The key reference documents used for this review are:

- *A7 2012-2013 GSC Information Return Capex 2011-12.xlsm*, Seqwater, February 2012
- *Project Management Plan, WTP Chemical Dosing Improvements*, Seqwater, Version 0.4, 29 November 2011

8.9.4. Prudency

According to the terms of reference when assessing items for the prudency and efficiency of 2011/12 estimated actual capital expenditure:

[1111] The Queensland Water Fluoridation Regulation (2008) was passed in March 2008.

"The consultant must assess the prudency and efficiency of 2011-12 non-drought[12] capital expenditure for each GSP that:

a) was not submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and

b) is material, where materiality is defined as exceeding $2 million;

The consultant must also assess the efficiency only of the 2011-12 non-drought capital expenditure for each GSP that:

a) was submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and

b) differs significantly (more than 30%) from the forecast costs submitted by the GSP during the 2011-12 investigation."

As this project was submitted as part of last year's review an assessment of prudency is not required.

8.9.5. Efficiency

The scope of works

The Project Management Plan, as referenced above states: "*As a result of the fluoride water quality incident at the North Pine WTP in April 2009 (Notified Queensland Health 13 May 09), Seqwater undertook extensive actions as part of the Fluoride Improvement Project to reduce the operating risks These actions are above and beyond the legislation and regulations and include:*

- *Design principle of dosing upstream of a treated water storage*
- *Fluoride ion selective electrode on-line analyser upstream of the treated water storage to monitor and alarm the fluoride dosing*
- *Fluoride ion selective electrode on-line analyses downstream of the treated water storage to alarm the fluoride levels entering the reticulation and for Queensland Health regulatory reporting*
- *Two flow meters to be installed upstream of the treated water storage. The primary flow meter for fluoride flow paced dosing control and the secondary flow meter as a quality check for the primary*"

The work method as stated above summarise the scope of work that Seqwater decided to undertake for the Stage 1 and Stage 2 water treatment plants. SKM considers the work method to be an appropriate method to ensure a more reliable fluoridation rate. Seqwater stated that a total of 112 fluoride improvement items were identified as of 28 November 2011 due to the Stage 1 and Stage 2 fluoridation legacy.

A list of the water treatment plant chemical dosing improvements was provided.

[12] Non-drought capital expenditure refers to capital expenditure that was not required as part of the Water Regulation 2002 or the Regional Water Security Program. As a consequence, it excludes many of the largest capital expenditure projects undertaken by the GSPs, such as the Hinze Dam raising or the Northern Pipeline Interconnector Stage 2.

Standards of works

Seqwater stated that the standards of works adopted for this project was that all work has to meet the following legislative requirements:

- *Water Fluoridation Act 2008*
- *Queensland Water Fluoridation Regulation (2008)*

Project cost

Seqwater stated within the Project Management Plan, as referenced above that: "*The project original allocated budget was set at $750,000. The Medium PCG endorsed a Q2 budget increase of $381,766 at the 12 Oct. 11 to give a total budget allocation of $1,131,766.*"

Seqwater stated within the Project Management Plan, that due to this being a program of works the following procurement delivery alternatives would be implemented:

- *"Separate engineering design and construction will be used on a number of the items. The D&C delivery model has failed to successfully deliver a number of the items in this program of works, so separating these two components reduces the risk of not meeting the quality objectives.*
- *Engineering design – package together design work into one contract where possible, engaging a consultant on the Engineering Services Panel.*
- *Engineering specialised services – If specialised services are required, approach engineering consultancy who can deliver it*
- *Minor Capital Works < $20 K – engage individual contractors who have a reliable reputation and relationship for delivering the service to Seqwater Contractor standards*
- *Minor Capital Works – $20 - $100 K – engage individual contractors who are on the Maintenance Services Standing Offer Panel and have a reliable reputation and relationship for delivering the service to Seqwater Contractor standards*
- *Capital Works > $100 K – Multiple quotes or tender as the procurement policy directs"*

Seqwater further stated that each separate program of work would identify and outline the project delivery strategy. Seqwater did not provide documentation showing the procurement method implemented for the various projects consequently it has not been possible to determine whether Seqwater has followed the overarching procurement method. The overarching procurement implementation method as quoted above does conform to industry practice and does ensure that all work undertaken is market tested.

8.9.6. Policy and procedures

Sufficient information was not provided to determine whether Seqwater has followed their procurement procedures in tendering and awarding the works for the various projects. It is however consider that the overarching procurement policy as stated with the Project Management Plan, as referenced above, is appropriate and follows good procurement practices.

8.9.7. Timing and deliverability

Seqwater have not provided information on the current status of the various projects.

8.9.8. Efficiency gains

No efficiency gains have been identified for this project.

8.9.9. Allocation of overhead costs

No information has been provided on allocation of overheads.

8.9.10. Summary

Assessment of the prudency of this project was not required.

SKM has not received sufficient information to assess whether the cost increase for the various water treatment plant chemical dosing improvement projects undertaken are efficient. The value of expenditure considered efficient is outlined below in **Table 167**. This is the amount approved in 2011/12.

- **Table 167 Various water treatment plant chemical dosing improvements - revised capital expenditure**

Project	Costs ($000s)
	2011/12
Various water treatment plant chemical dosing improvements	750

SKM recommends that the following additional information is to be provided by Seqwater to enable the assessment to be completed:

- A list of projects showing the cost breakdown of the original budget of $ 750,000 and the actual estimated expenditure
- Providing documentation demonstrating the various procurement methods implemented for the various projects
- Provide documentation demonstrating the method of identifying the various projects
- Provide documentation in regard to the status of the various improvement projects
- Provide documentation showing how corporate cost have been allocated to the various improvement projects

The adequacy of the information provided on this project is outlined below in **Table 168**.

- **Table 168 Adequacy of information provided**

Section of Capex review	Various water treatment plant chemical dosing improvements
Project description	
Provided documentation	
Prudency	

Section of Capex review	Various water treatment plant chemical dosing improvements		
Cost driver	Not required		
Decision making process	Not required		
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

8.10. Mt Crosby Eastbank Water Treatment Plant Renewals

8.10.1. Proposed capital expenditure

Table 169 shows the Authority approved 2011/12 cost of the Mt Crosby Eastbank Renewals project within the 2011/12 budget compared to the estimated actual value.

- **Table 169 Mt Crosby Eastbank Renewals project – change in 2011/12 capital expenditure**

Source	2011/12 Costs ($000s)			
	QCA approved value	Estimated actual value	Difference	% increase
A7 2012-2013 GSC Information Return Capex 2011-12.xlsx	670	1,049	379	57

As can be seen in **Table 169**, the estimated actual 2011/12 expenditure is approximately $ 379,000 or 57% greater than the value approved by the Authority.

8.10.2. Project description

The project is concerned with the renewal of existing assets at Mount Crosby Eastbank Water Treatment Plant.

The work is comprised of 11 component items, being:

1) Pump Station Crane renewals
2) Camerons Hill flow meter delivered water pipeline outlet
3) Asbestos removal
4) Sludge pipeline
5) Renewals project management
6) Flow control valve

7) Raw water pump 12
8) Backwash pipe work
9) Filter bank stage 2
10) Pump priming system
11) Switchboards

8.10.3. Provided documentation

The key reference documents used for this review are:

- *A7 2012-2013 GSC Information Return Capex 2011-12.xlsm*, Seqwater, February 2012
- *RFI ID No 0014 Mt Crosby EastBank Renewals*, Seqwater, 14 March 2012
- *RFI ID No 0014 Mt Crosby EastBank PS FAMP Final*, Seqwater, 26 May 2011
- *RFI ID No 0014 Mt Crosby Eastbank WTP FAMP*, Seqwater, 13 June 2011
- *RFI ID No 0014 Mt Crosby Eastbank PS SOW Refurbish Pump*, Seqwater, no date stated
- *RFI ID No 0014 Mt Crosby Eastbank SOW Asbestos removal*, Seqwater, 16 August 2011
- *RFI ID No 0014 Mt Crosby Eastbank SOW Filter Bank Stage 2*, Seqwater, 3 September 2011
- *RFI ID No 0014 Mt Crosby Eastbank SOW Filter valves and backwash*, no author stated, no date stated
- *RFI ID No 0014 Mt Crosby Eastbank SOW Flow control valve*, Seqwater, 26 September 2011
- *RFI ID No 0014 Mt Crosby Eastbank SOW H well crane repair scope*, no author stated, no date stated
- *RFI ID No 0014 Mt Crosby Eastbank SOW main SB upgrade*, Seqwater, 25 November 2011
- *RFI ID No 0014 Mt Crosby Eastbank SOW sludge line*, Seqwater, 5 September 2011
- *RFI ID No 0014 Mt Crosby Eastbank Work Breakdown flow control valve* no author stated, no date stated

8.10.4. Prudency

According to the terms of reference when assessing items for the prudency and efficiency of 2011/12 estimated actual capital expenditure:

> *The consultant must assess the prudency and efficiency of 2011-12 non-drought capital expenditure for each GSP that:*
>
> *a) was submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*
>
> *b) is material, where materiality is defined as exceeding $2 million;*
>
> *The consultant must assess the efficiency only of the 2011-12 non-drought capital expenditure for each GSP that:*

a) *was submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*

b) *differs significantly (more than 30%) from the forecast costs submitted by the GSP during the 2011-12 investigation."*

Of the 11 items comprising this project, eight items were submitted during the 2011/12 investigation. As per the terms of reference these items do not require a prudency assessment.

As stated in the *RFI ID No 0014 Mt Crosby EastBank Renewals* document, the three other items relate to *"a change in scope of one project, one new project, and one project being brought forwards from 2012-13"*. As the cost of these items is less than $ 2 million then, as per the terms of reference, no prudency assessment is required.

8.10.5. Efficiency

The scope of works

As stated previously the project is concerned with the renewal of 11 items at Mount Crosby Eastbank Water Treatment Plant. A further breakdown of the scope of works for each item is contained within the documentation provided for each item.

The *Pump Station crane renewal* document provides the following details of the scope of works for the crane refurbishment.

The tasks required for completion of this project are as follows:

- Replace the existing non compliant hoist with a unit that complies with AS 2550 and AS 1418
- Fully commission and test the unit

No information was provided regarding *Camerons Hill flow meter*.

The *Asbestos removal* document provides the following details of the scope of works for the asbestos removal:

- Asbestos material ceiling to be replaced (with appropriate material)
- New ceiling to have insulation installed above it
- All light fittings on the ceiling are to be replaced
- Asbestos material walls to be replaced (with appropriate material)
- Existing louvers in the walls are to be removed
- New windows are to be installed in the wall to allowing (sic) sufficient light during day time (Estimated that 3 windows are required in the filter corridor between the filters on either side and 2 windows on either side in the lime building corridor)
- The new ceiling, walls and the existing concrete walls in the corridors shall be primed and top coated with high quality water based paint
- Work shall be handed over clean

The *sludge pipeline* document provides the following details of the scope of works for the sludge pipe replacement:

- The new pipeline shall be installed parallel to the existing Poly Pipes keeping the existing in service. After the installation of the new pipeline, perform the cut-ins onto the MSCL pipes at the starting point and DICL at the end of the poly section. Then the existing Poly sections can be made redundant
- The installation of the new poly pipeline will be to installed (sic) underground to AS 2033.
- New air and scour valves shall be installed at the new pipeline

No information was provided regarding *Renewals Project Management*.

The *Flow control valve* document provides the following details of the scope of works for the flow control valve refurbishment:

- Spool piece specification
- Removal of valve and installation of spool piece
- Refurbishment of valve
- Actuating system replacement
- Removal of spool piece and installation of refurbished valve

The *Raw Water Pump 12* document provides the following details of the scope of works for the pump refurbishment:

- Dismantle pump unit, unit to be determined by efficiency test
- Remove casing from pump well and return to workshop
- Remove rotating element from pump well and return to workshop
- Refurbish pump casing, blast and paint (if required) internal casing of pump
- Refurbish rotating element as required
- Blast and Paint (if required) internal pump casing inside pump well
- Re-assemble rotating element and pump casing
- Paint external body of pump and associated pipe work
- Test and commission
- Document refurbishment procedure

The *Backwash pipe work* document provides the following details of the scope of works for the Filter valves and backwash.

The tasks required for completion of this project are as follows:

- Determine new valves, redesign pipe work to fit the valves and associated equipment
- Purchase, supply and install the new valves and equipment

- Commission new valves

The *Filter Bank Stage 2* document provides the following details of the scope of works for the replacement of the filter drain valves.

- The plan for this project is to replace or modify one drain valve on stage 1 and one on stage 2, as they are different type of sluice valve, prove the operation and sealing on the new or modified unit, then plan for the replacement of the remaining drain valves in next year's programme

The following procedure is stated in the same document:

- Isolation of filter, electrical isolation of valve drive unit and permit to work is to be performed by Seqwater Staff
- Removal of filer (sic) drain valve to be perform (sic) by contractor
- Inspection, measure up of existing valve and recommendation on replacement unit, or modification to existing unit, is to be performed by contractor
- Recommendation will have to be approved by Seqwater engineering & maintenance staff
- Pressure test on new or modified valve to guarantee sealing

No information was provided regarding *Pump Priming System*.

The *Switchboard upgrade* document provides the following details of the scope of works for the switchboard upgrade item.

- Design of new panel
- Construction and supply of new panel
- Decommissioning and disposal of old panel
- Installation and commissioning of the new panel

For the above projects the scope appears to be appropriate.

Standards of works

The standards of works adopted for this project have mostly not been specified in the documentation received.

The *RFI ID No 0014 Mt Crosby Eastbank SOW sludge line* document states that the new pipe work will be installed to AS 2033.

Notwithstanding the lack of documentation, it is anticipated that the works will conform to industry and Australian standards.

Project cost

There is a budget estimate within the documents received for each subproject which is not consistent with the information provided in response to RFI 14.

Table 170 Indicated budget variations

Project	Budget (project specific documents)	Revised Budget (RFI 14)	% Difference
Pump Station Crane renewals	-	$65,000	-
Cameron's Hill flow meter delivered pipeline outlet	-	$50,000	-
Asbestos removal	$171,500	$150,000	-13%
Sludge pipeline	$62,500	$220,000	252%
Renewals project management	-	$1,094	-
Flow control valve	$131,000	$151,000	15%
Raw water pump 12	$200,000	$94,380	-53%
Backwash pipe work	$60,000	$56,500	-6%
Filter bank stage 2	$61,500	$61,500	0%
Pump priming system	-	$50,000	-
switchboards	$102,000	$150,000	47%
Total	**$954,594[1]**	**$1,049,474**	**10%**

[1]where no budget was obtained from project specific documents, the revised budget was used.

The following statement is provided in *RFI ID No 0014 Mt Crosby EastBank Renewals* with regards to the cost variation between the approved value and the estimated actual value.

"The difference of $379,474, between the approved forecast and the estimated actual value, is predominantly explained by a change in scope of one project, one new project, and one project being brought forwards from 2012-13, as follows:

a) The sludge pipeline replacement is forecast to cost $155,000 more than was originally anticipated, because it was found that over 800m of pipeline needs replacement, as opposed to the 200m that was originally considered to need replacement.

b) The asbestos removal project, costing $150,000, is a new project that was unknown in last year's review process. The asbestos, which is located between the two filter banks and the lime building, was discovered during routine painting work this year. $150,000 is the lowest quote that was obtained during the procurement process.

c) The switchboard works, costing $150,000 were brought forwards from 2012-13 because there were considered to be efficiencies to be gained from having the works completed while the selected contractor was already on site working on the installation of equipment feeding power to this panel and being fed power from this panel.

The additional costs caused by the above three projects are partially offset by procurement successes in the flow control valve renewals project, which is now forecast to cost approximately $64,000 less than was originally anticipated. Some minor changes to the other components, including from better project scoping, account for the remaining $11,000 difference between the approved forecast and the estimated actual value for Mt Crosby Eastbank Renewals in 2011-12."

This statement is in part supported by the scope of works for the various items. The scope of works for the sludge pipeline replacement confirms that the length was originally thought to be 200 metres. Additionally, the date of the scope of works for the asbestos removal project is August 2011, which indicates that the project was not planned until this financial year. However, the scope of works for the flow control valve states that the cost estimate for that item was $131,000. This amount is less than the value of $ 151,000 stated in the *RFI ID No 0014 Mt Crosby EastBank Renewals* document.

No details of any tenders, tendering process or procurement strategy for the works have been provided that would support the stated project cost and hence the cost increase.

8.10.6. Policy and procedures

No details have been received that illustrate that Seqwater have followed their procurement procedures in tendering the works for this project.

8.10.7. Timing and deliverability

The current status of the project's program has not been provided in the documentation received.

8.10.8. Efficiency gains

As stated earlier, *RFI ID No 0014 Mt Crosby EastBank Renewals* details that the decision to bring forward the switchboard works was driven by *"efficiencies to be gained from having the works completed while the selected contractor was already on site working on the installation of equipment feeding power to this panel and being fed power from this panel"*.

8.10.9. Allocation of overhead costs

No information has been provided on allocation of overheads.

8.10.10. Summary

A prudency assessment is not required as the items constituting the project have either been previously reviewed or are under $ 2 million and hence under the terms of reference do not require a prudency assessment.

The project is assessed as efficient.

Notwithstanding that insufficient evidence was provided, particularly for the three sub projects of sludge pipe work, the asbestos removal and the switchboard replacement, the brief scope of works for these three sub projects is acceptable.

The value of expenditure not considered to be prudent or efficient: Nil.

To ensure a comprehensive audit document trail is created the following information must be provided:

- A breakdown of costs by sub-project including project management, design and contingencies.

- Standards of works
- Evidence of procedures used
- Project plan

The adequacy of the information provided on this project is outlined below in **Table 171**.

- **Table 171 Adequacy of information provided**

Section of Capex review	Mt Crosby Eastbank Water Treatment Plant Renewals		
Project description			
Provided documentation			
Prudency			
Cost driver	Not required		
Decision making process	Not required		
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

8.11. Asset Management System: P&C - Intranet Stage 2 & 3

8.11.1. Proposed capital expenditure

Table 172 shows the Authority approved 2011/12 cost of the Asset Management System: P&C Intranet Stage 2 & 3 project within the 2011/12 budget compared to the estimated actual value.

- **Table 172 Asset Management System: P&C Intranet Stage 2 & 3 project – change in 2011/12 capital expenditure**

Source	2011/12 Costs ($000s)			
	QCA approved value	Estimated actual value	Difference	% increase
A7 2012-2013 GSC Information Return Capex 2011-12.xlsx	120	400	280	233

As can be seen in **Table 172**, the estimated actual 2011/12 expenditure is approximately $ 280, 000 or 233% greater than the value approved by the Authority.

8.11.2. Project description

This project is comprised of the latter two phases of the delivery of a new intranet system for Seqwater as a whole. Stage 2 aimed to deliver ‘must have’ functions that emerge from staff feedback gathered after the launch of Stage 1, resolve any issues identified and build on its strengths with the more simple 'like to have' functionality, which includes integration with more advanced business systems and tools. Stage 3 aimed to further expand the capabilities, dynamics and functions of collaborative tools, and introduce useful add-on features such as e-learning programs.

8.11.3. Provided documentation

The key reference documents used for this review are:

- *A7 2012-2013 GSC Information Return Capex 2011-12.xlsm*, Seqwater, February 2012
- *Background Information – Seqwater Intranet Stages 2 & 3*, Seqwater, no date
- *Seqwater Intranet Project: Final recommendations and brief*, Design Communication Associates, October 2010
- *Seqwater Intranet Project: Draft Detailed Design Document V1*, Design Communication Associates, April 2011
- *Evaluation Report and Recommendation: Web Content Management System*, Seqwater, April 2011
- *Intranet Governance Charter*, Version 2A, Seqwater, June 2011
- *Intranet Master List of Requirements No 12*, no author, no date

8.11.4. Prudency

According to the terms of reference when assessing items for the prudency and efficiency of 2011/12 estimated actual capital expenditure:

> *"The consultant must assess the prudency and efficiency of 2011-12 non-drought[13] capital expenditure for each GSP that:*
>
> *a) was not submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*
>
> *b) is material, where materiality is defined as exceeding $2 million;*
>
> *The consultant must also assess the efficiency only of the 2011-12 non-drought capital expenditure for each GSP that:*
>
> *a) was submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*
>
> *b) differs significantly (more than 30%) from the forecast costs submitted by the GSP during the 2011-12 investigation."*

As this project was submitted as part of last year's review an assessment of prudency is not required.

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[13] Non-drought capital expenditure refers to capital expenditure that was not required as part of the Water Regulation 2002 or the Regional Water Security Program. As a consequence, it excludes many of the largest capital expenditure projects undertaken by the GSPs, such as the Hinze Dam raising or the Northern Pipeline Interconnector Stage 2.

8.11.5. Efficiency

The scope of works

The scope of works for Stages 2 and 3 have been described as:

- Stage 2 aims to deliver 'must have' functions that emerge from staff feedback gathered after the launch of Stage 1, resolve any issues identified and build on its strengths with the more simple 'like to have' functionality, which includes integration with more advanced business systems and tools
- Stage 3 aims to further expand the capabilities, dynamics and functions of collaborative tools, and introduce useful add-on features such as e-learning programs, online forms, work flows, integrations to core systems like email & ERP system

A breakdown of the scope items is contained in the *Intranet Master List of Requirements No 12* spreadsheet and details 62 items that comprise the project. The progress of the development items and resolution items that comprise the project are tracked in this spreadsheet.

The items are listed under the following headings:

- Completed Development
- Outstanding Development
- Issue Resolution
- Testing and Deployment

As listing each of the 62 items would be exhaustive, the following are the items that have either taken or have been estimated to take four or more days to complete as detailed in the spreadsheet:

- *"My Page functionality*
- *Investigate the possibility of building a new type of Overview type page that looks a lot like the Home page? They want to be able to have a summary of announcements and news like the home page....they also want a weather widget that gives the local weather report*
- ....
- *Bubble up of announcements and news articles*
- *Show certain Announcements only on HomePage*
- *Outlook calendar integration with the Intranet. A one way sync from a public outlook calendar to the intranet is all that is needed at this point, but a bi-directional sync is a future requirement.*
- *The Announcement articles on the Communications page get pushed further and further down the page. Needs to be fixed to behave in the same way as the News items (ie. pages are created for them after a certain amount of articles have been created).*
- ...
- *Fix Scheduled Publishing of Pages.*

- *Forum Moderation Functionality to be fixed - need ability to reply directly to a comment in a seperate post (available to Super Admins only)*
- *Modify MyPage to be able to subscribe.*
- *Find way to index a network folder.*
- *Create Forms pagetype for Clubs to list their forms from Q-Pulse*
- *Develop Custom Statistics Gathering & Reporting tool.*
- *Wiki Proof of Concept. Tab on HomePage.*
- *...”*

Standards of works

The standards of works adopted for this project have not been specified in documentation received to date.

Project cost

Seqwater advise that the variance in the 2011/12 project budget, approved versus estimated actual, for the Intranet Stages 2 and 3 project is caused by three factors:

1) *“The project commenced late causing implementation costs to spill over into the 11-12 financial year (budgeting was completed assuming full implementation of stage one of the project on the 10-11 financial year ($150,000 or greater than 50% of the variance)*
2) *The project budget figure was set before the actual costs of the delivery of the business requirements was known*
3) *The project budget figure did not allow for some known, or any evolving, business requirements”*

The *Seqwater Intranet Project: Final recommendations and brief* (Design Communication Associates, October 2010) developed for the overall project did not specify expenditure requirements for Stages 2 and 3 of the project and recommended that these items be scoped closer to when they were required/to be implemented for a more accurate estimate. For the 2011/12 budget an expenditure estimate of $ 120,000 was included for Stages 2 and 3.

Seqwater provided the following, **Table 173**, showing the actual and proposed budget expenditure. The budget was set in advance of the project being implemented and, due to the delay in project start, the project cost moved into the next financial year (ie 2011/12).

Table 173 Proposed and actual budget expenditure

Year	Budget / Business Case	Forecast	Actual	Notes
09/10	$180,000 for the project in the 2010-11 FY $120,000 (2011-12 FY amount set approx at project start)			Amounts set in accordance with budgeting process, ie in this case, in advance of the business case)

Year	Budget / Business Case	Forecast	Actual	Notes
10/11	$192,800 - $212,800 (set in Sep 2010)	$290,000 (adjusted on basis of now known costs of the technology & resources)	$246,894	At the end of 2010-11 the project had not gone live but had basically delivered 80% of the business case items listed for stage 1 as well as many stage 2 items
11/12	Unspecified (acknowledged as unquantifiable at time of approval)	$400,000	$240,649 (spent to date) $350,000 (Estimated Yr end)	The project went live on 16 August 2011, 6 weeks into the 2011/12 FY) at that stage the project delivered 95% of stage 1 items and most of the stage 2 functionality.

Source: *Background Information – Seqwater Intranet Stages 2 & 3*, Seqwater, no date

The *Evaluation Report and Recommendation: Web Content Management System* (Seqwater, April 2011) identifies that an initial closed tender process was completed in November 2010 however none of the chosen tenderers submitted an offer. A review of this unsuccessful process resulted in a change in the scope of works and the tender was re-released on the 7th March 2011 with 11 offers submitted prior to the tender closing. The tenders were reviewed and evaluated following Seqwater's tender review process. The process recommended, on the 21st April 2011, the selection of Netcat.biz Pty Ltd for a fixed price of $ 118,740 (plus GST).

8.11.6. Policy and procedures

Seqwater appear to have followed there procurement procedures in tendering and awarding the works for this project.

8.11.7. Timing and deliverability

The *Background Information – Seqwater Intranet Stages 2 & 3* document states that the project is "in the middle of ... Stage 3" of the Business Case Implementation Plan. This stage relates to the "Post Go-Live" phase of the Project Implementation Plan.

8.11.8. Efficiency gains

Efficiency gains are the subject of the project. A benefit realisation plan should be developed to measure the gains.

8.11.9. Allocation of overhead costs

A contingency of 12.5% has been applied to the project.

8.11.10. Summary

A prudency assessment is not required as the project was submitted as part of last year's review.

The project is assessed efficient.

The basis of the increase in the original 2011/12 budget is what it was estimated in 2009/10 and was acknowledged as difficult to quantify at the time of approval.

The value of expenditure not considered to be prudent or efficient: Nil.

The adequacy of the information provided on this project is outlined below in **Table 174**.

- **Table 174 Adequacy of information provided**

Section of Capex review	Asset Management System: P&C - Intranet Stage 2 & 3		
Project description			
Provided documentation			
Prudency			
Cost driver	Not required		
Decision making process	Not required		
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

8.12. Caboolture Water Treatment Plant Renewals

8.12.1. Proposed capital expenditure

Table 175 shows the Authority approved 2011/12 cost of the Caboolture Water Treatment Plant renewals within the 2011/12 budget compared to the estimated actual value.

- **Table 175 Caboolture Water Treatment Plant renewals – change in 2011/12 capital expenditure**

Source	2011/12 Costs ($000s)			
	QCA approved value	Estimated actual value	Difference	% increase
A7 2012-2013 GSC Information Return Capex 2011-12.xlsx	143	378	235	164

From **Table 175** above, the estimated actual 2011/12 expenditure is $ 235, 000 or 164% greater than the value approved by the Authority during the Grid Service Charges Review 2011/12.

8.12.2. Project description

The renewals project at the Caboolture Water Treatment Plant consists of two items: replacement of the main switchboard and installing a motorised trolley for the chlorine gas hoist.

The original budget for the renewals project at the Mt Crosby Water Treatment Plant made allowance for $143,000. Seqwater has indicated that the original budget was underestimated and did not allow for all the cost components.

8.12.3. Provided documentation

The key reference documents used for this review are:

- *A7 2012-2013 GSC Information Return Capex 2011-12.xlsm,* Seqwater, February 2012
- *Facility Asset Management Plan – Caboolture WTP,* Seqwater, November 2010.
- *Project Management Plan – Caboolture WTP Main Switchboard Upgrade,* Seqwater, Revision 1.0, 9 September 2011.
- *Scope of Works – Caboolture WTP – Main Switchboard Replacement,* Seqwater, February 2012
- *Project Summary – Caboolture WTP – Chlorine Gas Hoist – Motorised Trolley,* Seqwater [No date supplied]
- *Information Request Response for Caboolture WTP Renewals RFI ID No. 0014,* Seqwater, 13 March 2012.
- *Information Request Response for Caboolture WTP Renewals RFI ID No. 0035,* Seqwater, 22 March 2012.

8.12.4. Prudency

According to the terms of reference when assessing items for the prudency and efficiency of 2011/12 estimated actual capital expenditure:

> *"The consultant must assess the prudency and efficiency of 2011-12 non-drought[14] capital expenditure for each GSP that:*
>
> *a) was not submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*
>
> *b) is material, where materiality is defined as exceeding $2 million;*
>
> *The consultant must also assess the efficiency only of the 2011-12 non-drought capital expenditure for each GSP that:*
>
> *a) was submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*

[14] Non-drought capital expenditure refers to capital expenditure that was not required as part of the Water Regulation 2002 or the Regional Water Security Program. As a consequence, it excludes many of the largest capital expenditure projects undertaken by the GSPs, such as the Hinze Dam raising or the Northern Pipeline Interconnector Stage 2.

b) *differs significantly (more than 30%) from the forecast costs submitted by the GSP during the 2011-12 investigation."*

As this project was submitted as part of last year's review an assessment of prudency is not required.

8.12.5. Efficiency

The scope of works

The scope of work that was included within the Grid Service Charges Review 2011/12 is shown within **Table 176** below and their associated allocated cost at the time.

- **Table 176 Breakdown of changes in scope of works and 2011/12 capital expenditure**

ID	Scope item	Original estimated cost	Estimated actual cost	Item status
1	Replacement of main switchboard	$130,000	$370,000	
2	Chlorine gas hoist	$13,000	$8,000	
Total		**$143,000**	**$378,000**	

Item 1 replacement of main switchboard

Seqwater stated within the Project Management Plan, as referenced above, that: "*The aim of this project is to replace the main switchboard and treated water Motor Control Cubicle (MCC) and associated electrical installation at the Caboolture WTP.*"

Item 2 installation of motorised trolley chlorine gas hoist

The scope of work for this item included:

- Replacing the existing manual chlorine gas drum hoist with a motorised trolley handling system

Standards of works

Item 1 replacement of main switchboard

Seqwater has stated that the existing switchboard does not meet current electrical standards and that the switchboard poses an increased risk of failure and an increased safety risk to operations and maintenance staff due to the following reasons:

- There are exposed busbars and terminations not equipped with touch or fall protection
- The switchboard does not the required 600mm clearance for the paths of egress as required by AS3000:2007

Item 2 installation of motorised trolley chlorine gas hoist

Seqwater stated within the Project Summary, as referenced above, that: *"It is proposed to supply and install a new 2 Tonne Motorised Trolley to allow the operator ease of moving and positioning the Chlorine Drums into their operating cradle. The installation would require the installation of a new 4* *button pendant control, new catenary system and upgrade the power supply to a lockable power isolator."*

Project cost

Item 1 replacement of main switchboard

Seqwater stated within the Information Request Response to RFI ID No. 0014 that: "*The original forecast to deliver the Water PS Switchboard was provided at a very early stage in scoping the necessary work, which underestimated the likely costs. The current estimate takes account of a more thorough scoping, project management cost, necessary inspections and internal costs during commissioning, as well as contingency, all of which were not adequately represented in the initial forecast.*"

Seqwater has advised that the scoping and detailed design component of this project has been completed. The detail design and scoping was undertaken externally and three quotes were requested for this item. Seqwater has indicated that a total of $ 70,000 has been spent to date and is at present within the procurement phase with Request for Tender documents being prepared.

The revised cost estimate as presented by Seqwater within the Project Management Plan, as referenced above, is summarised within **Table 177** below.

- **Table 177 Item 1 cost breakdown summary**

Description	Cost ($)
Design scope	7,500
Detail design contract	70,000
Supply and install contract	215,000
Internal costs	25,000
Subtotal A	317,500 (287,500 in referenced document)
Project management	25,000
Contingency (8%)	27,500
Total	**370,000**

Item 2 installation of motorised trolley chlorine gas hoist

Seqwater has updated the cost estimate for the installation of the motorised trolley chlorine gas hoist from the cost estimate that was submitted as part of the Grid Service Charges 2011/12 to the Authority. The updated cost estimate is lower than the value approved by the Authority.

The costs are assessed as reasonable.

8.12.6. Policy and procedures

Seqwater has generally followed their policies and procedures in identifying the items and in procurement.

8.12.7. Timing and deliverability

Item 1 – replacement of main switchboard

Seqwater states within the Project Management Plan, as referenced above, that: "*The plant is scheduled to be off-line again next winter (2012). The project will therefore aim to carry out the switchboard changeover and commissioning in April 2012.*" Seqwater has not provided additional information in regards to the progress made and to whether this project is on schedule. It is noted that April is an autumn month.

Item 2 – installation of motorised trolley chlorine gas hoist

Seqwater has not provided information stating the current status of this item. Consequently it could not be determined whether the project is complete.

8.12.8. Efficiency gains

Seqwater has not stated any efficiency gains that are expected as a result of undertaking the two items.

8.12.9. Allocation of overhead costs

The contingency of 8% is considered slightly below allowed to being below industry standard contingency of 10% to 15%. From **Table 177** above it can be seen that the project management cost and internal cost make up 14% of the cost and that the detail design component make up 19% of the cost

8.12.10. Summary

The project has not been assessed for prudency in accordance to the terms of reference.

It is considered that the additional cost to item 1 can be attributed to underestimating at the front end of the project and that the revised cost submitted to the Authority to be more in line with market conditions and realistic overall project costs.

The items have been assessed as efficient.

The value of any expenditure considered to be not prudent or efficient is: Nil.

The following additional information is should be provided by Seqwater to complete a comprehensive audit trail:

- Project schedule and status

The adequacy of the information provided on this project is outlined below in **Table 178**.

Table 178 Adequacy of information provided

Section of Capex review	Caboolture Water Treatment Plant renewals
Project description	

Section of Capex review	Caboolture Water Treatment Plant renewals		
Provided documentation			
Prudency			
Cost driver	Not required		
Decision making process	Not required		
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

8.13. Esk Water Treatment Plant Renewals

8.13.1. Proposed capital expenditure

Table 179 shows the Authority approved 2011/12 cost of the Esk Water Treatment Plant Renewals project within the 2011/12 budget compared to the estimated actual value.

- **Table 179 Esk Water Treatment Plant Renewals project – change in 2011/12 capital expenditure**

Source	2011/12 Costs ($000s)			
	QCA approved value	Estimated actual value	Difference	% increase
A7 2012-2013 GSC Information Return Capex 2011-12.xlsx	85	289	204	340

As can be seen in **Table 179**, the estimated actual 2011/12 expenditure is approximately $ 204, 000 or 340% greater than the value approved by the Authority.

8.13.2. Project description

The following works are included in this project:

- Raw water pump
- Replace main switch board
- Replace roof Clearwater tank
- Replace screen hoist
- Construct chemical unloading bund

The first three items were not included in the previous review of the 2011/12 budget.

A further item has been removed from the scope of the project since the previous review of the 2011/12 budget. This item is:

- Office for operations manager renewals

8.13.3. Provided documentation

The key reference documents used for this review are:

- *A7 2012-2013 GSC Information Return Capex 2011-12.xlsm*, Seqwater, February 2012
- *RFI ID No 0014 Esk WTP renewals Capex RFI Response*, Seqwater, 12 March 2012
- *RFI ID No 0014 Esk WTP clearwater tank roof*, Seqwater, no date
- *RFI ID No 0014 Esk WTP Main Switch Board Safety*, Seqwater, no date
- *RFI ID No 0014 Esk WTP raw water pump Esk wtp*, Seqwater, no date
- *RFI ID No 0014 Esk WTP - FAMP*, Seqwater, 22 January 2010

8.13.4. Prudency

According to the terms of reference when assessing items for the prudency and efficiency of 2011/12 estimated actual capital expenditure:

> *"The consultant must assess the prudency and efficiency of 2011-12 non-drought[15] capital expenditure for each GSP that:*
>
> *a) was not submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*
>
> *b) is material, where materiality is defined as exceeding $2 million;*
>
> *The consultant must also assess the efficiency only of the 2011-12 non-drought capital expenditure for each GSP that:*
>
> *a) was submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and*
>
> *b) differs significantly (more than 30%) from the forecast costs submitted by the GSP during the 2011-12 investigation."*

The two items that were submitted to the Authority during the 2011/12 investigation do not require a prudency assessment.

The value of the additional items is each less than $2 million, hence a prudency assessment is not required.

[15] Non-drought capital expenditure refers to capital expenditure that was not required as part of the Water Regulation 2002 or the Regional Water Security Program. As a consequence, it excludes many of the largest capital expenditure projects undertaken by the GSPs, such as the Hinze Dam raising or the Northern Pipeline Interconnector Stage 2.

8.13.5. Efficiency

The scope of works

For the three work items that have been included in the project since the previous review of the 2011/12 budget, a high level scope of works is provided in each relevant RFI response document as follows.

The tasks required for the raw water pump replacement are stated as:

- *"Organise contractor to install new pump*
- *Installation of new pump*
- *Commissioning of pump"*

The tasks required for the mains switchboard replacement are stated as:

- *"Design upgrade and plan installation*
- *Installation of upgrade*
- *Commission upgraded switch board"*

The tasks required for the Clearwater Tank roof replacement are stated as:

- *"Design new roof and plan installation (backup storage required)*
- *Removal of old roof (asbestos removal company)*
- *Installation of new roof"*

Standards of works

The standards of works adopted for this project have not been specified in documentation received to date.

Project cost

In the *RFI ID No 0014 Esk WTP renewals Capex RFI Response*, Seqwater have provided the following statement that addresses the variance in the 2011/12 project budget:

> *"The existing roof on the Clearwater tank at Esk water treatment plant is made of fibro material which contains asbestos. This roof is in poor condition and needs to be replaced. The existing main switchboard at Esk WTP has been identified in an audit as requiring a safety upgrade for budgeted to make it meet the necessary standards for switch boards. Both works are relating to safety upgrades."*

Seqwater also provided the costs stated in **Table 180** that relate to the actual and proposed budget expenditure in the *RFI ID No 0014 Esk WTP renewals Capex RFI Response*.

Table 180 Proposed and actual budget expenditure

Items	2011/12 Approved value ($)	2011/12 Q2 Budget ($)
Raw water pump	0	38,142

Items	2011/12 Approved value ($)	2011/12 Q2 Budget ($)
Replace main switch board	0	20,000
Replace roof Clearwater Tank	0	182,000
Replace screen hoist	19,500	18,000
Construct chemical unloading bund	26,000	31,000
Office for operations manager renewals	39,000	0
Total	**84,500**	**289,142**

With respect to the three items that were previously reviewed, Seqwater has not provided an explanation of why one item has been excluded from the project's scope. As the review is concerned with efficiency only, this item has been excluded from further discussion.

With respect to the two remaining items from the previous review Seqwater have not provided an explanation of why there is a variance in the approved and actual cost for these two items. The cost of replacing the screen hoist is about eight percent less than the approved cost and hence is assessed as efficient. The cost of constructing the chemical unloading bund has increased by about 20 percent. No explanation has been provided although it should be noted that the increase is a minor value (ie $ 5,000).

With respect to the three additional items, Seqwater has not provided an explanation as to why the items have been included in the budget nor as to how the cost has been calculated.

The additional items are stated in the *Facility Asset Management Plan* in Appendix 1 the Esk Water Treatment Plants' Ten Year Renewal and Refurbishment Program schedule as being included in renewal works for earlier financial years. The dates stated in the schedule do not correspond with the review period and no explanation is given as to why the expenditure has been delayed.

The scheduled dates with respect to the additional items are:

- Clearwater Tank roof was scheduled for the 2009/10 financial year
- raw water pump replacement was scheduled for the 2010/11 financial year
- mains switchboard replacement was scheduled for the 2010/11 financial year

No breakdown of these costs has been provided to date, however the RFI documents that relate to each of the additional items provide details of the resourcing and delivery methods. These are the same for each of the three items and are stated as follows in each RFI document:

> *"Delivery method will be supplied contactor using a purchase Order. Internal resource requirements are as follows:*
>
> *15) "SMP&R Civil engineer & Civil supervisor – specify and supervise replacement.*
>
> *16) "Tech Services / Operations Representative – advise operational need."*

The resourcing and delivery approach stated by Seqwater is reasonable considering the additional items are concerned with the renewal of existing assets.

Without additional details, the project cost cannot be assessed as efficient.

8.13.6. Policy and procedures

Details have not been supplied that confirm the method for procuring the project. This prevents confirmation that the project has followed Seqwater's policies and procedures.

Seqwater's Policy Handbook outlines several methods for procuring goods and services. Assuming that a Standard Panel arrangement would be utilised for the project the following methods would be used for the project:

- Less than $ 100,000 may be obtained from one supplier
- Between $ 100,000 and $ 500,000 need to develop a Request for Quote (RFQ)

Consequently for the replacement of the Clearwater Tank roof an RFQ is required.

8.13.7. Timing and deliverability

As stated previously, Appendix 1 of the *Facility Asset Management Plan* details the Esk Water Treatment Plants' Ten Year Renewal and Refurbishment Program schedule. The dates stated in the schedule do not correspond with the review period and no explanation is given as to why the expenditure has been delayed.

Details of the revised program of works have not been provided in any of the documentation received to date and hence the deliverability cannot be assessed.

8.13.8. Efficiency gains

No efficiency gains have been identified for this project.

8.13.9. Allocation of overhead costs

No information has been provided on allocation of overheads.

8.13.10. Summary

The review of the project has considered each item comprising the project due to each item effectively being its own sub-project and as several items have been added to the project since the last review.

Under the terms of reference a prudency assessment of the two items approved during the previous review is not required. Nor is it required for the three additional items as the costs are less than $ 2 million separately and in aggregate. It should be noted that one item from the previous review that was approved is not included in the recent budget.

With respect to the efficiency assessment the lack of an explanation as to why the project cost has changed prevents the project being assessed as efficient.

The value of any expenditure considered to be prudent and efficient is outlined below in **Table 181**.

- **Table 181 Esk Water Treatment Plant Renewals Project - revised capital expenditure profile**

Project	Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
Esk Water Treatment Plant Renewals	49	-	-	-	-	49

The following details should be provided:

- The project's programme
- A cost breakdown for each item i.e. provide relevant quotes/ tenders
- An explanation as to why one previously approved item (the office for operation manager renewals) has been excluded
- An explanation as to why have three additional items been included

The adequacy of the information provided on this project is outlined below in **Table 182**.

- **Table 182 Adequacy of information provided**

Section of Capex review	Esk Water Treatment Plant Renewals		
Project description			
Provided documentation			
Prudency			
Cost driver	Not required		
Decision making process	Not required		
Efficiency			
Scope of works			
Standards of work			
Project cost			
Policy and procedures			
Timing and deliverability			
Efficiency gains			
Allocation of overhead costs			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

8.14. Overall Summary

A sample of eleven projects were identified and assessed as a representative sample of the capital expenditure program for 2011/12 for Seqwater. We have assessed these projects against the

Authority's definitions of prudency in particular the relevant driver and the decision making process and efficiency, including the standards of service, scope of work, timeliness of delivery and the costs.

Five of the eleven projects have not been assessed as efficient. It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment to be made. The projects are:

- North Pine Water Treatment Plant Filter Upgrade
- Mt Crosby Eastbank Water Treatment Plant High Voltage Renewals
- Mt Crosby Westbank Renewals
- Various Water Treatment Plant Chemical Dosing Improvements
- Esk Water Treatment Plant Renewals

Table 183 provides an overview of the final assessment made for each project of the project sample chosen for assessment of prudency and efficiency

- **Table 183 2011/12 sample project summary - revised capital expenditure profile ($000s)**

Project	Cost 2011/12 ($000s)	Prudent	Efficient	Revised Cost 2011/12 ($000s)
North Pine Dam Gates Upgrade	873	Prudent	Efficient	873
Mt Crosby WTP Water Quality Improvement	3,769	Assessment not required	Efficient	3,769
North Pine WTP Filter Upgrade	2,551	Assessment not required	Insufficient information to assess expenditure as efficient	1,800
Mt Crosby Eastbank WTP High Voltage Renewals	1,374	Assessment not required	Insufficient information to assess expenditure as efficient	690
North Pine WTP Fluoride Dosing Point Relocation	1,048	Assessment not required	Efficient	1,048
Mt Crosby Westbank Renewals	814	Assessment not required	Efficient	514
Various WTP Chemical Dosing Improvements	1,132	Assessment not required	Insufficient information to assess expenditure as efficient	750
Mt Crosby Eastbank Renewals	1,049	Assessment not required	Efficient	1,049
AMS: P&C - Intranet Stage 2 & 3	400	Assessment not required	Efficient	400
Caboolture WTP Renewals	378	Assessment not required	Efficient	378
Esk WTP Renewals	289	Assessment not required	Insufficient information to assess expenditure as efficient	49

- **Table 184 Seqwater capital expenditure review 2011/12**

Section of Capex review	North Pine Dam Gates Upgrade	Mt Crosby Water Treatment Plant Water Quality Improvement	North Pine WTP Filter Upgrade	Mt Crosby High Voltage Upgrade	North Pine WTP Fluoride Dosing Point Relocation	Mt Crosby Westbank Water Treatment Plant renewals	Various Water Treatment Plant Chemical Dosing improvements	Mt Crosby Eastbank Water Treatment Plant Renewals	Asset Management System: P&C - Intranet Stage 2 & 3	Caboolture Water Treatment Plant Renewals	Esk WTP Renewals
Project description											
Provided documentation											
Prudency											
Cost driver		Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required
Decision making process		Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required
Efficiency											
Scope of works											
Standards of work											
Project cost											
Policy and procedures											
Timing and deliverability											
Efficiency gains											
Allocation of overhead costs											

Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

For the North Pine Water Treatment Plant Filter Upgrade, insufficient information was provided to assess whether the project is efficient. It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information should include:

- An explanation of the cost increase
- The project cost plan
- Tender process and review
- The project program
- Confirmation of the standard of works

For the Mt Crosby Eastbank Water Treatment Plant High Voltage Renewals, insufficient information was provided to assess whether the project is efficient. It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information should include:

- The post contract scopes of work

For the Mt Crosby Westbank Renewals, insufficient information was provided to assess whether the project is efficient. It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information should include:

- Project status information

For the Various Water Treatment Plant Chemical Dosing Improvements, insufficient information was provided to assess whether the project is efficient. It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information should include:

- A list of projects showing the cost breakdown of the original budget of $ 750,000 and the actual estimated expenditure
- Providing documentation demonstrating the various procurement methods implemented for the various projects
- Provide documentation demonstrating the method of identifying the various projects
- Provide documentation in regard to the status of the various improvement projects
- Provide documentation showing how corporate cost have been allocated to the various improvement projects

For the Esk Water Treatment Plant Renewals, insufficient information was provided to assess whether the project is efficient. It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information should include:

- The project’s programme
- A cost breakdown for each item i.e. provide relevant quotes/ tenders

- An explanation as to why one previously approved item (the office for operation manager renewals) has been excluded
- An explanation as to why have three additional items been included

Two of the eleven projects have been assessed as efficient however insufficient information was provided, it is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment to be made. The projects are:

- Mt Crosby Eastbank Renewals
- Caboolture Water Treatment Plant Renewals

Although the Mt Crosby Eastbank Renewals has been assessed as efficient, insufficient information was provided. It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information must include:

- A breakdown of costs by sub-project including project management, design and contingencies.
- Standards of works
- Evidence of procedures used
- Project plan

Although the Caboolture Water Treatment Plant Renewals has been assessed as prudent and efficient, insufficient information was provided. It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information must include:

- Project schedule and status

9. Proposed revised templates

We have amended the submission templates for capital and operating expenditure in accordance with our evaluation of the operating and capital expenditure items reviewed on an exception basis.

A summary of changes for operating and capital expenditure items is provided below.

9.1. Operating expenditure

We have amended the operating expenditure in accordance with our evaluation of the sample of operating expenditure items reviewed. We found all operating expenditure in our sample to be prudent, however, in a number of samples we found that the operating expenditure proposed was not efficient.

The recommended operating costs after the review of the samples are found in **Table 185**.

▪ **Table 185 Recommended amendments to operating cost budgets**

Opex item		Asset	Seqwater proposed	SKM recommended
10	Employee Expenses	Bundamba AWTP	$ 2,418,984	$ 2,085,127
13	Repairs & Maintenance	Pipeline Network	$ 2,997,198	$ 2,873,000
15	People and Culture	Corporate Costs	$ 4,349,677	$ 4,154,077

9.2. Capital expenditure

The following tables summarises our recommended alternate budget costs for capital expenditure items reviewed for 2012/13 and 2011/12 that we consider were either not prudent and or not efficient.

▪ **Table 186 2012/13 recommended amendments to capital cost budgets**

Project	Revised Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
Maroon Dam - Stage 1 Safety Upgrade	250	3,800	-	-	-	4,050
Business Driven Projects from ICT Ops Plan Plant & Equipment	-	1,700	-	-	-	1,700
NSI Lime System Sludge Lagoon	-	0	-	-	-	0
Lowood Water Treatment Plant – Sludge handling improvements and other works	300	-	-	-	-	300
Beaudesert Water Treatment Plant Upgrade	-	0	0	0	-	0
Boonah Kalbar Water Treatment Plant – Automation/Pipeline Upgrade						
Project 1	300	2,629	2,629	-	-	5,558
Project 2		0	0	-	-	0
Project 3		0	0	-	-	0

Project	Revised Costs ($000s)					
	2011/12	2012/13	2013/14	2014/15	Subsequent	Total
Total	300	2,629	2,629	-	-	5,558

- **Table 187 2011/12 recommended amendments to capital cost budgets**

Project	Revised Cost 2011/12 ($000s)
North Pine WTP Filter Upgrade	1,800
Mt Crosby Eastbank WTP High Voltage Renewals	690
Mt Crosby Westbank Renewals	514
Various WTP Chemical Dosing Improvements	750
Esk WTP Renewals	85

10. Conclusions and overall recommendations

10.1. Conclusion

SKM has reviewed the prudency and efficiency of a sample of Seqwaters' operating and capital expenditure costs for 2012/13 and the review of past capital expenditure projects from 2011/12 based on the information provided by Seqwater. In addition SKM has reviewed the policies and procedures adopted by Seqwater for operating and capital expenditure budget planning.

10.2. Overall recommendations

The overall recommendations are that:

- **Policies and procedures review** – While Seqwater's procurement policies and procedures do not provide for sustainable purchasing per se, its requirement to adhere to State Procurement Policy does require it to integrate sustainability into the procurement of goods, services and construction. A further concern that we have is the arrangement for sole sourcing from tender panels. The relatively high limit of up to $100,000 of such single source purchases with limited required review from supervisory managers could allow misuse. It may be prudent for further limits to be placed on such an arrangement

10.3. Operational Expenditure

From the review undertaken by SKM all but one operating expenditure project reviewed was determined to be prudent and efficient. **Table 188** below presents the revised operating expenditure.

- **Table 188 Summary of revised operating costs ($000s)**

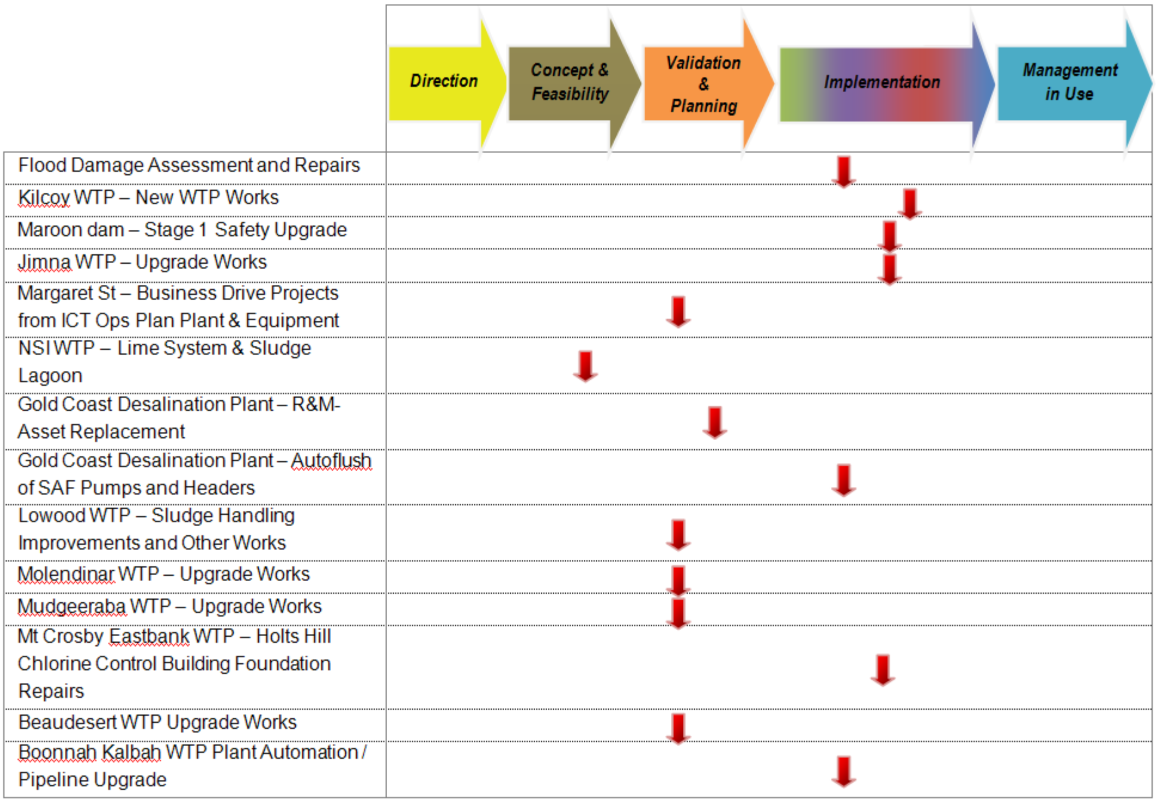
Operating Expenditure item		Asset	Value $000s (2012/13)	Prudent	Efficient	Revised Value ($000s)
1	Catchment Management & Maintenance - Salaries and Wages - Awards + Repairs & Maintenance	Wivenhoe Dam	746	Prudent	Efficient	746
2	Dam and Source Ops - Employee costs	North Pine Dam	342	Prudent	Efficient	342
3	Employee Expenses	Bundamba AWTP	2,419	Prudent	Insufficient information to assess all expenditure as efficient	2,085
4	People and Culture	Corporate Costs	4,350	Prudent	Expenditure efficient except recruitment fees	4,154
5	Electricity	Mt Crosby Eastbank WTP	2,503	Prudent	Efficient	2,503
6	Treatment Chemicals	Landers Shute WTP	1,315	Prudent	Efficient	1,315
7	Electricity	Luggage Point	1,652	Prudent	Efficient	1,652

	Operating Expenditure item	Asset	Value $000s (2012/13)	Prudent	Efficient	Revised Value ($000s)
		AWTP				
8	Repairs & Maintenance	Gold Coast Desalination Plant	5,167	Prudent	Efficient	5,167
9	Repairs & Maintenance	Pipeline Network	2,997	Prudent	Partially efficient	2,873
10	ICT Services	Corporate Costs	12,871	Prudent	Efficient	12,871
11	Repairs & Maintenance	Molendinar WTP	1,289	Prudent	Efficient	1,289
12	Infrastructure Maintenance - Planned	North Pine WTP	628	Prudent	Efficient	628
13	Infrastructure Maintenance - Scheduled	Mt Crosby Westbank WTP	508	Prudent	Efficient	508
14	Catchment Management & Maintenance - Repairs & Maintenance	Hinze Dam	491	Prudent	Efficient	491
15	Water Quality Monitoring	Gold Coast Desalination Plant	520	Prudent	Efficient	520

10.4. Capital expenditure 2012/13

A sample of fourteen projects were identified and assessed as a representative sample of the capital expenditure program for 2012/13 for Seqwater. SKM has assessed these projects against the Authority's definitions of prudency in particular the relevant driver and the decision making process and efficiency, including the standards of works, scope of work, timeliness of delivery and the costs.

The status of the fourteen projects relative to the Seqwater Delivery Framework is illustrated in **Figure 18**.



- **Figure 18 Status of projects within the Seqwater Delivery Framework**

The capital expenditure of six of fourteen projects were assessed as both prudent and efficient. The exceptions are:

- Flood Damage Assessment and Repairs
- Maroon Dam - Stage 1 Safety Upgrade
- North Stradbroke Island Water Treatment Plant - Lime System and Sludge Lagoon
- Lowood Water Treatment Plant - Sludge Handling Improvements and Other Works
- Molendinar Water Treatment Plant - Upgrade Works
- Mudgeeraba Water Treatment Plant - Upgrade Works
- Beaudesert Water Treatment Plant Upgrade Works
- Boonah Kalbar Water Treatment Plant - Plant Automation/Pipeline Upgrade

Table 189 provides an overview of the final assessment made for each project of the project sample chosen for assessment of prudency and efficiency.

- **Table 189 2012/13 sample project summary - revised capital expenditure profile ($000s)**

Project	Cost 2012/13 ($000s)	Prudent	Efficient	Revised Cost 2012/13 ($000s)
Flood Damage Assessment	9,848	Prudent	Insufficient information to	0

Project	Cost 2012/13 ($000s)	Prudent	Efficient	Revised Cost 2012/13 ($000s)
and Repairs			assess all expenditure as efficient	
Kilcoy WTP - New WTP Works	14,931	Prudent	Efficient	14,931
Maroon Dam - Stage 1 Safety Upgrade	4,000	Prudent	Insufficient information to assess all expenditure as efficient	3,800
Jimna WTP - Upgrade Works	1,661	Prudent	Efficient	1,661
Business Driven Projects from ICT Ops Plan Plant & Equipment	1,700	Prudent Note: Insufficient information to assess expenditure beyond 2012/13 as prudent	Efficient Note: Insufficient information to assess expenditure beyond 2012/13 as efficient	1,700
NSI WTP - Lime System & Sludge Lagoon	1,075	Insufficient information to assess expenditure as prudent	Efficiency not assessed	0
Gold Coast Desalination Plant - R&M-Asset Replacement	3,812	Prudent	Efficient	3,812
Gold Coast Desalination Plant - Autoflush of SAF Pumps and Headers	1,975	Prudent	Partially efficient	1,544
Lowood WTP - Sludge Handling Improvements and Other Works	2,000	Prudent	Insufficient information to assess expenditure as efficient	0
Molendinar WTP - Upgrade Works	2,000	Insufficient information to assess expenditure as prudent	Efficiency not assessed	0
Mudgeeraba WTP - Upgrade Works	2,000	Insufficient information to assess expenditure as prudent	Efficiency not assessed	0
Holts Hill Chlorine Control Building Foundation Repairs	1,654	Prudent	Efficient	1,654
Beaudesert WTP Upgrade Works	2,500	Insufficient information to assess expenditure as prudent	Efficiency not assessed	0
Boonah Kalbar WTP Plant Automation / Pipeline Upgrade	2,500	Prudent	Insufficient information to assess all expenditure as efficient	2,500

Table 191 summarises the adequacy of information for the fourteen projects.

- **Table 190 Seqwater capital expenditure review 2012/13**

Section of Capex review	Flood Damage Assessment and Repairs	Kilcoy WTP - New WTP Works	Maroon Dam Stage 1 Safety Upgrade	Jimna Water Treatment Plant Upgrade Works	Business Driven Projects from ICT Ops Plan Plant and Equipment	NSI Lime System Sludge Lagoon	GCDP Repairs & Maintenance	GCDP Autoflush SAF Pumps Header	Lowood WTP – Sludge Handling Improvements	Molendinar Water Treatment Plant upgrade	Mudgeeraba Water Treatment Plant Upgrade	Holts Hill Chlorine Control Building foundation repairs	Beaudesert Water Treatment Plant Upgrade	Boonah Kalbar Water Treatment Plant – Automation/Pipeline Upgrade
Project description														
Provided documentation														
Prudency														
Cost driver														
Decision making process														
Efficiency														
Scope of works														
Standards of work														
Project cost														
Policy and procedures														
Timing and deliverability														
Efficiency gains														
Allocation of overhead costs														

Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

Comparing the project status, prudency and efficiency assessment and adequacy of information illustrates that projects further along the implementation journey are more likely to have more adequate information and be assessed as prudent and efficient. It is noted that this assessment is at a specific point in time, and that the purpose of this review is to determine the validity of entry of costs into the RAB.

Consequently there is a situation whereby this review is unable to confirm the prudency or efficiency due to its position in the implementation journey, whilst good practice requires an allowance to be made in Seqwater's forward budget.

Where prudency and/or efficiency cannot be established, this does not solely mean that the project is inappropriate, it may mean that the status of the project is not sufficiently progressed to enable confirmation of entry of all costs into the RAB. A contributing factor to this maybe the frequency of reviews being shorter than the implementation period of large capital expenditure projects.

Information requirement to enable the completion of the review are indicated in **Section 7**.

10.5. Capital expenditure 2011/12

A sample of eleven projects of the capital expenditure program for 2011/12 were identified as requiring additional review due to unexpected increases in actual estimated costs compared with approved budget and assessed. We have assessed these projects against the Authority's definitions of prudency in particular the relevant driver and the decision making process and efficiency, including the standards of service, scope of work, timeliness of delivery and the costs.

Four of the eleven projects have not been assessed as efficient**. Table 191** provides an overview of the final assessment made for each project of the project sample chosen for assessment of prudency and efficiency.

- **Table 191 2011/12 sample project summary - revised capital expenditure profile ($000s)**

Project	Estimated actual value 2011/12 ($000s)	Prudent	Efficient	Revised value 2011/12 ($000s)
North Pine Dam Gates Upgrade	873	Prudent	Efficient	873
Mt Crosby WTP Water Quality Improvement	3,769	Assessment not required	Efficient	3,769
North Pine WTP Filter Upgrade	2,551	Assessment not required	Insufficient information to assess expenditure as efficient	1,800
Mt Crosby Eastbank WTP High Voltage Renewals	1,374	Assessment not required	Insufficient information to assess expenditure as efficient	690
North Pine WTP Fluoride Dosing Point Relocation	1,048	Assessment not required	Efficient	1,048
Mt Crosby Westbank	814	Assessment	Efficient	514

Project	Estimated actual value 2011/12 ($000s)	Prudent	Efficient	Revised value 2011/12 ($000s)
Renewals		not required		
Various WTP Chemical Dosing Improvements	1,132	Assessment not required	Insufficient information to assess expenditure as efficient	750
Mt Crosby Eastbank Renewals	1,049	Assessment not required	Efficient	1,049
AMS: P&C - Intranet Stage 2 & 3	400	Assessment not required	Efficient	400
Caboolture WTP Renewals	378	Assessment not required	Efficient	378
Esk WTP Renewals	289	Assessment not required	Insufficient information to assess expenditure as efficient	49

The adequacy of information supplied is summarised in **Table 192**.

Table 192 Seqwater capital expenditure review 2011/12

Section of Capex review	North Pine Dam Gates Upgrade	Mt Crosby Water Treatment Plant Water Quality Improvement	North Pine WTP Filter Upgrade	Mt Crosby High Voltage Upgrade	North Pine WTP Fluoride Dosing Point Relocation	Mt Crosby Westbank Water Treatment Plant renewals	Various Water Treatment Plant Chemical Dosing improvements	Mt Crosby Eastbank Water Treatment Plant Renewals	Asset Management System: P&C - Intranet Stage 2 & 3	Cabooolture Water Treatment Plant Renewals	Esk WTP Renewals
Project description											
Provided documentation											
Prudency											
Cost driver		Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required
Decision making process		Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required
Efficiency											
Scope of works											
Standards of work											
Project cost											
Policy and procedures											
Timing and deliverability											
Efficiency gains											
Allocation of overhead costs											

Legend			
Legend	Sufficient documentation	Moderate issues / conflicting documentation	No documentation / major issues with documentation

Comparison of the efficiency assessment and the adequacy of information table illustrates that documentation regarding decision making, costs and adherence to policy and procedures are the common issues.

It is recommended that the above additional information is gathered and the projects resubmitted the extent of this information is detailed in **Section 8**.

Various obstacles to reporting were encountered, these included:

- Information format and adequacy
- Timeframe of review
- Location of this review in the project delivery journey
- Availability of resources within Seqwater

It is acknowledged that there is a short timeframe in which to provide the required information, however the information should be available as a result of good practice. Notwithstanding the above, Seqwater staff cooperated extensively and worked beyond normal business hours to respond to requests and queries. This commitment is appreciated.

Appendix A Terms of Reference

Phase 1 – 2011/12 fixed and variable operating expenditure (Opex) review

The Authority requires a detailed review of the current level of fixed operating costs (including overhead and fixed employee costs) and variable costs incurred by the GSPs. The assessment would be performed on data submitted by the bulk entities for the 2011/12 period, as well as additional data requested from the GSPs as appropriate.

The consultancy is intended to build upon the review of operating costs conducted during the 2011/12 GSC investigation. The consultancy will:

a) benchmark the GSPs against key cost parameters at relevant comparator organisations and good industry practice. Benchmark assessments may include parameters such as FTEs to water volume ratio, FTE to asset capacity ratio, maintenance to asset value ratio, operational costs to overhead costs ratio, total fixed costs to water volume ratio etc;

b) identify any duplication of effort relating to fixed operating costs between GSPs, their contractors and the WGM; and

c) identify any potential efficiency improvements and achievable operating cost (fixed and variable) savings as a result of the Seqwater-Water Secure merger on 1 July 2011.

The consultant will use a bottom up, needs-based assessment of costs on a functional level in order to understand what costs within a function are directed to which activities.

While noting that non-direct (indirect and overhead) cost categories are not standardised across the GSPs, the consultancy will review the following fixed operating cost activities:

a) Asset Management;

b) Capital Planning;

c) Engineering Services;

d) Planned and unplanned maintenance; and

e) Administration.

The consultancy will review all component costs of the above activities including internal and external (contractor's) costs to identify potential efficiency improvements.

In order to establish the basis for an assessment of the GSP's proposed overhead and fixed employee costs, the consultant will need to outline:

a) the services provided by the bulk entities' head offices;

b) major overhead and fixed employee cost categories and their key cost drivers (and how they are tied into the GSP's respective business objectives);

c) high level indicators to assess the relative efficiency of cost components using appropriate comparators, good industry practice and available benchmarking data. Examples of such indicators could include FTEs as a proportion of overhead costs, overhead costs as a percentage of total operating costs, or proprietary benchmarking tools which establish rates of efficiency; and

d) given constraints related to employee retention, how the Authority could assess the potential for efficiency gains once the GSP's provide their projected expenditure for 2012/13. This could include quantum and timing of any potential efficiency gains.

In regard to variable costs, the consultancy should review potential savings in energy and chemical costs, within the constraints of demand forecasts defined by the Government.

The Authority's objective is to have this phase complete by 29 February 2012.

Phase 2 – 2012/13 GSC Draft Report investigation

The Authority is required to publish a Draft Report detailing recommended Grid Service Charges for 2012/13 by 30 April 2012. The Authority requires assistance in assessing the prudency and efficiency of the GSP's proposed capital and operating costs for 2012/13.

Phase 2 will commence following the receipt of the GSP's information submissions on 29 February 2012, to be completed by 23 March 2012. Phase 2 is comprised of three components.

Component 1 – Prudency and Efficiency of 2012/13 forecast Operating Expenditure

The consultant must assess whether each of the GSPs' submitted operating costs proposed for 2012/13 are prudent and efficient. The assessment of prudency and efficiency of operating expenditure will review a representative sample, to be agreed with the Authority, of each GSP's forecast operating costs. The sample should include the top 10% of operating expenditure items by value and, preferably, at least 50% of the total operating expenditure.

In assessing prudency and efficiency, the consultant must:

a) assess whether the GSPs' policies and procedures for operational expenditure represent good industry practice;

b) assess the standards of service adopted by each GSP and whether these standards have been approved by external agencies. The consultant should where appropriate refer to broader benchmark analysis of Phase 1;

c) assess whether the GSPs' operating expenditure is prudent. Operating expenditure is prudent if it is required to meet the GSP's requirements relating to:

    c) its Grid Contract;

    d) the South East Queensland System Operating Plan; and

    e) production forecasts for the regulatory period are to consistent with the grid instructions forecast in the Operating Strategy (or any successor documents) and any relevant information provided to the GSPs in accordance with the system operating plan;

d) assess whether the GSPs' operating expenditure is efficient. Operating expenditure is efficient if it is undertaken in a least-cost manner over the life of the relevant assets and is consistent with relevant benchmarks. In assessing efficiency, the consultant must have regard to the conditions prevailing in relevant markets, historical trends in operating expenditure and the potential for efficiency gains or economies of scale; and

e) assess the appropriateness of any allocation methodology of overhead operating costs.

Component 2 – Prudency and Efficiency of 2011/12 estimated actual Capital Expenditure

The consultant must assess the prudency and efficiency of 2011/12 non-drought[16] capital expenditure for each GSP that:

a) was not submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011/12 GSC investigation; and

b) is material, where materiality is defined as exceeding $2 million;

The Authority does not expect that this will be a large number of items, but may include some material capital expenditure to rectify damage caused by the January 2011 floods that was not included in the GSPs' 2011/12 submissions.

The consultant must also assess the efficiency only of the 2011/12 non-drought capital expenditure for each GSP that:

a) was submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011/12 GSC investigation; and

b) differs significantly (more than 30%) from the forecast costs submitted by the GSP during the 2011/12 investigation.

Again, the Authority does not expect that this will be a large number of items. If the total number of items to be reviewed exceeds 15, the Authority will agree a representative sample with the consultant.

Component 3 – Prudency and Efficiency of 2012/13 forecast Capital Expenditure

The consultant must assess the prudency and efficiency of a representative sample of 2012/13 forecast non-drought capital expenditure for each GSP. The sample, to be agreed with the Authority, should include all capital expenditure projects exceeding $2 million in value, the top 10% of capital expenditure projects by value and at least 50% of total capital expenditure.

For any capital expenditure project that was commenced in 2011/12, but will incur expenditure during 2012/13, the consultant must take into account the Authority findings in its investigation of 2011/12 GSCs.

The definition of prudency and efficiency to be adopted by the consultant are the same as those in Component 2 above.

The consultant must also assess:

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[16] Non-drought capital expenditure refers to capital expenditure that was not required as part of the Water Regulation 2002 or the Regional Water Security Program. As a consequence, it excludes many of the largest capital expenditure projects undertaken by the GSPs, such as the Hinze Dam raising or the Northern Pipeline Interconnector Stage 2.

a) whether the entities' policies and procedures for forecasting capital expenditure represent good industry practice. In particular, the policies and procedures must reflect strategic development plans, integrate risk and asset management planning, corporate directives, be consistent with external drivers, and incorporated robust procurement practices;

b) whether corporate or overheads costs have been appropriately assigned to capital expenditure projects.

For the purposes of the Phase 2 review, capital expenditure is prudent if it required as a result of a legal obligation, growth in demand (consistent with the grid instructions forecast in the Operating Strategy (or any successor documents) and any relevant information provided to the GSPs in accordance with the system operating plan); renewal of existing infrastructure that is currently used and useful, or it achieves an increase in reliability or quality of supply that is explicitly endorsed or desired by the WGM.

Capital expenditure is efficient if:

a) the scope of the works (which reflects the general characteristics of the capital item) is the best means of achieving the desired outcomes after having regard to the options available, including the substitution possibilities between capex and opex and non-drought network alternatives such as demand management;

b) the standard of the works conforms with technical, design and construction requirements in legislation, industry and other standards, codes and manuals. Compatibility with existing and adjacent infrastructure is relevant as is consideration of modern engineering equivalents and technologies; and

c) the cost of the defined scope and standard of works is consistent with conditions prevailing in the markets for engineering, equipment supply and construction. The consultant must substantiate it view with references to relevant interstate and international benchmarks and information sources. For example, the source of comparable units and indexes must be given and the efficiency of costs justified. The consultant should identify the reasons for any costs higher than normal commercial levels.

Phase 3 – 2012/13 GSC Final Report investigation

Following the publication of the Authority's Draft Report, the Authority will receive submissions from GSPs and other stakeholders. These submissions may include updated information or challenge the technical findings included in the Authority's Draft Report.

The consultant must assist the Authority in responding to stakeholder submissions by:

a) considering its Phase 2 recommendations in light of new information; and

b) responding to technical matters included in stakeholder submissions.

The extent of work required for Phase 3 will depend on the complexity of submissions received from stakeholders.

Phase 3 will commence in May 2012 after the receipt of stakeholder submissions and will be complete by mid-June 2012. More precise dates will be negotiated with the consultant as the project progresses.

Appendix B Comments after consideration of SEQ Water Grid Manager Submission

B.1 Background

The SEQ Water Grid Manager compiled a submission titled 2012/13 Grid Service Charges for the Queensland Competition Authority. This was provided to SKM on 22/03/2012. The following review has been completed with respect to the sample projects. This appendix indicates the changes to the review outcomes after considering the SEQ Water Grid Manager information.

- **Table 193 Summary of outcomes**

Project	Outcome
Kilcoy Upgrade	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission.
Jimna Upgrades	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission.
North Stradbroke Island Upgrades	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission.
Gold Coast Desalination Plant Autoflush of SAF Pumps and Headers	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission.
Lowood Upgrades including sludge handling improvements	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission. The outcome of Seqwater's investigations could be effected by the SEQ Water Grid Manager submission.
Molendinar Upgrade	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission. The outcome of Seqwater's investigations could be effected by the SEQ Water Grid Manager submission.
Mudgeeraba Upgrade	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission. The outcome of Seqwater's investigations could be effected by the SEQ Water Grid Manager submission.
Beaudesert Upgrade	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission. The outcome of Seqwater's investigations could be effected by the SEQ Water Grid Manager submission.
Boonah Kalbar WTP Upgrade	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission.

B.1.1 General

The submission documents, amongst other information the required function of the Water Treatment Plants, as indicated in **Table 194** below.

- **Table 194 Function of each water treatment plant within the connected area to the water grid.**

Base Load Water Treatment Plants	*Supplementary Water Treatment Plants*	*Water Treatment Plants from which supply is not required, at least for five years*
Noosa	*Banksia Beach*[2]	*Albert River*[3]
Landers Shute	*Capalaba*	*Aratula*[3]
North Pine	*Ewen Maddock*	*Brisbane Aquifer Project*

Base Load Water Treatment Plants	*Supplementary Water Treatment Plants*	*Water Treatment Plants from which supply is not required, at least for five years*
North Stradbroke Island	*Gold Coast Desalination Plant*	*Caboolture*
Petrie	*Mt Crosby Westbank*	*Enoggera*
Molendinar	*Western Corridor Recycled Water Scheme*	*Image Flat*[4]
Mt Crosby Eastbank		*Maleny*[3]
Mudgeeraba		*Murrumba Downs*[5]
Petrie[1]		*Toogoolawa*[3]
		South Maclean
		Woodford
		Woorim[3]

Notes:

1) *Subject to detailed investigation. Capacity augmentation is required in around five years. This may involve connection to the northern Pipeline Interconnector, from which time supply may no longer be required from this water treatment plant.*
2) *Subject to detailed reliability investigation to be undertaken with Unity Water. Depending upon outcome, supply may not be required.*
3) *Permanently decommissioned.*
4) *No supply required from the time that the connection from the Northern Pipeline Interconnection is completed and commissioned.*
5) *The Murrumba downs advanced water treatment Plant is a Unitywater asset, the cost of which the Water Grid Manager contributes under contract. Supply has been minimised. It will be demobilised if and when the Minister approves a proposed change to the grid contract.*

Source: 2012-13 Grid Service Charges – Submission to Queensland Competition Authority pp 27

The provision of this information is essential to the efficient operation of the Grid. The development of the operating strategy illustrates the developing maturity the SEQ Grid and its operation. The grid participants are all companions in this journey, with each undertaking a specific role. Whilst the responsibility for the development of the operating strategy is uncertain, the detail is extremely important to the efficient operation of the Grid, and if available would have been useful in previous reviews. The responsibility for the development of this information is neither the responsibility of the bulk water supply manager (Seqwater) nor the bulk water transport manager (LinkWater) as they only operate and manage a part of the over water service provision. Similarly, as the water Grid Managers role is focussed on Annual Operations Plans and the monthly directions to achieve this, it is uncertain why the responsibility for developing the 20 year operational strategy, has been taken by the Water Grid Manager. Notwithstanding this, the detail has been much awaited and eagerly anticipated, as it was an obvious missing piece in the Grid operations puzzle.

B.1.2 SEQ Water Grid Manager 20 year Operational Strategy

The soon to be released 20 year operational strategy will be of significant use to all the Grid Service Provider entities, as it will greatly assist them in developing their strategic development plans. Prior to the development of this 20 year operational strategy and the information in the SEQ Water Grid Manager Submission, the Grid Service Provider could reasonably have been expected to ensure that individual elements, such as water treatment plants and distribution pipelines, were capable of supplying at the nominal capacity of the plant.

B.1.3 Levels of Service

The Levels of Service articulated in the SEQ Water Grid Manager Submission is included below:

- During nominal operations, sufficient water will be available to meet an average total urban demand of 375 litres per person per day (including residential, non-residential and system losses., of which 230 litres per person per day is attributed to residential demand
- Medium level restrictions will not occur more than once every 25 years on average
- Medium level restrictions need only achieve a targeted reduction in consumption of 15% below the total consumption volume in normal operations
- The frequency of triggering drought response infrastructure will be not more than once every 100 years on average
- The frequency that the total volume of water stored by all key water grid storages declines to 10% of their combined water storage capacity will be not more than once every 1000 years, on average
- The total volume of water stored by all key water grid storages must not be permitted to reach 5% of the combined total water storage capacity of these storages
- Wivenhoe, Hinze and Baroon pocket dams must not be permitted to reach minimum operating levels
- It is expected that medium level restrictions will last longer than 6 months no more than once every 50 years, on average

It is understood that these Levels of Service where developed by the Queensland Water Commission during the Millennium drought. It is generally implicit within Levels of Service (LOS) that the higher the LOS the higher the cost of the infrastructure set to achieve these LOS.

B.2 Sample

The Water Grid Manager submission has made commentary on various water treatment plants. The projects that were both part of the Authorities review sample and upon which the Water Grid Manager has made comment are indicated in **Table 195** below.

- **Table 195 Sample project selection**

Project	SKM	SEQ WGM	2012/13 Cost ($000s)
Kilcoy WTP Upgrade	✓	✓	8,353
Jimna WTP Upgrades	✓	✓	1,661
North Stradbroke Island WTP Upgrades	✓	✓	1,075
Gold Coast Desalination Plant Autoflush of SAF Pumps and Headers	✓	✓	1,975
Lowood Upgrades including sludge handling improvements	✓	✓	2,000
Molendinar WTP Upgrade	✓	✓	2,000
Mudgeeraba WTP Upgrade	✓	✓	2,000
Beaudesert WTP Upgrade	✓	✓	2,500

Project	SKM	SEQ WGM	2012/13 Cost ($000s)
Boonah Kalbar WTP upgrade	✓	✓	2,500

The SEQ Water Grid Manager made comment on 20 projects. **Table 195** indicates that only 9 were common to the sample. Notwithstanding this, this represents 61% by value.

The commentary on each project is described separately below. For ease of review the Water Grid Managers comments are included and then the review comments follow.

B.2.1 Kilcoy Water Treatment Plant

SEQ Water Grid Manager Comments Section 5.14

The Seqwater submission reflects that an upgrade of the Kilcoy Water Treatment Plant is underway, at an estimated total cost of $16.1 million.

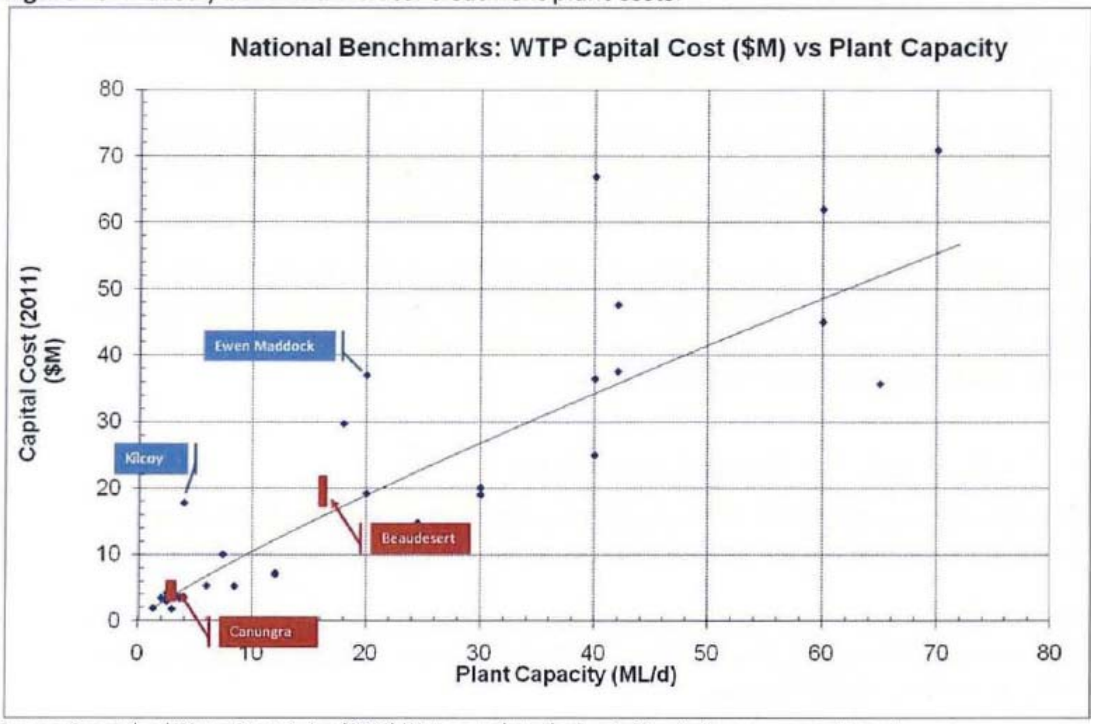
The Water Grid Manager has previously provided advice about this project to Seqwater, the Queensland Competition Authority and the responsible Minsters. That advice remains extant. In summary, the Water Grid Manager:

- *agreed that improvements to the existing supply are required in order to meet its contractual obligations*
- *noted that the project cost appears to be high, compared to benchmark rates for similar water treatment plants*
- *noted that the project specifications are more stringent that what is required under its Grid Contract with Seqwater or, to the best of its knowledge, a direction from the Office of the Water Supply Regulator*
- *recommended that the upgrades to the Kilcoy Water Treatment Plant be deferred by three months to enable a more fulsome comparison with a pipeline option*
- *requested urgent advice as to the risks associated with such a delay.*

The upgrade was considered by the Queensland Competition Authority in its 2011–12 determination, which stated that the Authority encouraged Seqwater to instigate further discussions with the Water Grid Manager regarding the prudency of the Kilcoy Water Treatment Plant project. The Authority noted that the Kilcoy Water Treatment Plant is not to be commissioned until 2013-14 and therefore had no immediate impact on the recommendation of 2011-12 Grid Service Charges.

The recommended discussions have not occurred, and no further information or advice has been provided about the concerns raised. However, we note that information provided by Seqwater as part of a separate planning process reflects that the Kilcoy Water Treatment Plant is more expensive than benchmark industry rates (see Figure 15, comments in original).

Figure 15: Industry benchmark water treatment plant costs.



Source: Queensland Water Commission (2011) *Water supply to the Scenic Rim: Options assessment report.*

Based on the significant amount of additional information provided by Seqwater, the SKM review concluded that:

- The project is assessed as prudent. The primary driver of compliance has been demonstrated and an acceptable decision making process has been documented
- The project is assessed efficient as the scope is appropriate, the standards of works are/are not consistent with industry practice and the costs are consistent with prevailing market conditions

Notwithstanding the above, it is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information should include:

- Response to the SEQ Water Grid Manager's concerns raised in the 2011 report
- Documentation demonstrating the need for lime CO_2 dosing to achieve the target water quality from the raw water being sourced
- Needs analysis or business case which covers the raw and treated water pipeline duplications and includes options analyses and cost estimates
- An explanation of the difference in budget (both in size and allocation between financial years) between this year's GSC Information Return and the Kilcoy Water Treatment Plant Board Paper dated 09/06/11

The following specific comments are made relative to Water Grid Manager summary comments

- *Noted that the project cost appears to be high, compared to benchmark rates for similar water treatment plants*

The costs where market tested, and as such represent market value at the point in time of tendering.

- *Noted that the project specifications are more stringent that what is required under its Grid Contract with Seqwater or, to the best of its knowledge, a direction from the Office of the Water Supply Regulator*

It is our assessment that the specifications are not unreasonable, including the revised turbidity target of 0.3 NTU. Reference is made to **Section 7.8.5** of this report which details the issue. In addition it is noted that during the treatment process, some parameters are reduced below final concentration to allow for the effect of subsequent actions, such as the addition of lime to create acceptable alkalinity. In addition, at times the physiochemical parameters are used as indicators of biological parameters and their existence or removal. Turbidity is often used as an indicator of pathogens, and consequently the reduction of turbidity to levels that indicate the removal of pathogens is not unusual.

- *Recommended that the upgrades to the Kilcoy Water Treatment Plant be deferred by three months to enable a more fulsome comparison with a pipeline option*
- *Requested urgent advice as to the risks associated with such a delay.*

Seqwater have advised that they completed additional analysis on the pipeline options (reported in the GHD addendum) and that the outcome was increased NPV costs for the pipeline, which were already greater than the Water Treatment Plant options. In addition, Seqwater advise that time was of the essence as demand was the same as supply capacity, and consequently the 3 month delay could not be accommodated. Anecdotal information was provided that a supply shortage incident occurred recently, illustrating the criticality of the issue.

The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission.

With regard to discussions between Seqwater and the Water Grid Manager, SKM is not aware of meetings or otherwise, although it would be expected that they would have occurred as the subject has been of interest of the Minister.

B.2.2 Jimna Water Treatment Plant

SEQ Water Grid Manager comments Section 5.19

Seqwater proposes to $1.9 million of upgrades to the Jimna Water Treatment Plant, in 2012-13 and 2013-14. The submission states that these upgrades are required for compliance purposes, but does not provide any further information. There is no reference to these works being required in 2012-13 in the interim statement from Seqwater to the Queensland Water Commission, dated 28 February 2012.

The Water Grid Manager recommends that further information is required to demonstrate the need for this expenditure.

The Water Grid Manager understands that this plant has had operational improvements made since Seqwater took ownership of it, resolving many of the initial water quality issues. The Water Grid Manager is not aware of any water quality or supply issues since these improvements were undertaken.

In relation to capacity, current annual demand is about 13 ML (0.04 ML/day). Treatment capacity is 0.2 ML per day.

The prudency and efficiency review completed by SKM, reviewed the information provided by Seqwater and made the following conclusions:

- The project is assessed as prudent. The primary driver of compliance has been demonstrated and an appropriate decision making process has been documented
- The project is assessed efficient as the scope is appropriate, the standards of works should be consistent with industry practice and the costs will be consistent with prevailing market conditions
- The value of expenditure considered not to be prudent and efficient: Nil

The basis of this assessment is the assertion by Seqwater that the works are required to complete the temporary works that were undertaken to improve the facility from the non compliant condition that it was in at the time of transfer.

It is understood that the facility has been operating acceptably since these temporary works. In addition, the outcome of the review indicates that there is still design optimisation works required, which should be undertaken as part of the detailed design phase, and that additional information needs to be provided to create a complete audit trail. This information is as indicated below:

- Specifics of feasibility / options assessment
- Any option studies, including any assessment of the ‘do nothing’ option to justify the level of automation selected for the plant
- Cost details of operational efficiencies, such as from the turn down ration which will enable the new plant to be operated continuously at a low rate during periods of base load demand
- Options analysis or cost comparison used to ensure particular elements of the selected scope of work are the best means of achieving the desired outcomes
- Evidence that off-site sludge handling or disposal has been considered as an alternative to a new sludge handling system
- Confirmation of process design limits, in particularly turbidity
- Justification of escalation rate

As indicated above, the basis of the assessment of prudency is the completion of temporary works. It is noted that incomplete works has created poor outcomes in the past as illustrated by several facilities transferred to Seqwater delivery the SEQ water reforms.

The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission.

Notwithstanding the above, as Seqwater manages its facilities based on a risk management process and the Water Grid Manager and Queensland Competition Authority are focussed on reduction in expenditure, particularly in the short term, a discussion could be held between the Water Grid Manager, the Authority and Seqwater regarding whether Seqwater are prepared to accept a higher level of risk of non compliance to facilitate a cost saving.

B.2.3 North Stradbroke Island Water Treatment Plant

SEQ Water Grid Manager comments Section 5.8

Seqwater has proposed to undertake about $4.6 million of upgrades to the North Stradbroke Island Water Treatment Plant, including about $4.1 million for the lime system and sludge lagoon. There is no reference to these works being required in 2012-13 in the interim statement from Seqwater to the Queensland Water Commission, dated 28 February 2012.

The Water Grid Manager endorses any works required to maintain the ability to consistently access its full entitlement from the borefield. In relation to Herring Lagoon, it recommends that no major expenditure occur until the future role ofthe supply is agreed by all parties, including both the scope of any required works and the timing of those works. Based on information provided, this would appear to include the proposed lime system and sludge lagoon.

As background, the North stradbroke Island Water Treatment Plant is a critical water treatment plant, providing base load supply for use in the Redlands and Cleveland demand zones and for tran sfer west through the Eastern Pipeline Interconnector.

The North stradbroke Island Water Treatment Plant accesses water from a number of bores, as well as surface water from Herring Lagoon. Water from Herring Lagoon is typically high in colour and turbidity due to vegetation tannins leeching into the water, particularly after rainfall events. High colour and turbidity makes this water more costly and complicated to treat than water taken from the borefields. Specifically:

- *Treatment of water from Herring Lagoon typically involves the use of the dissolved air flotation unit. Water sourced from the borefields generally only requires pH correction and disinfection.*
- *The Herring Lagoon Water Treatment Plant has two sludge pools to dry the sludge that comes from the treatment process when sourcing water from Herring Lagoon, which requires the use of a coagulant. This sludge, once dried, needs to be transported off the Island for disposal with associated operational costs and environmental impacts. Sludge volumes increase with production.*

The Water Grid Manager, Queensland Water Commission and Seq water are reviewing the future role and function ofthe Herring Lagoon source, in consultation with the Department of Environment *and Resource Management. Key considerations include the costs of increasing the take from the lagoon, compared to alternative supplies.*

The assessment by SKM, based on information provided by Seqwater, indicated that regardless of the transfer of entitlements, a sludge lagoon has been identified as necessary for either the current arrangement or one involving a higher number of bore fields. The size of the sludge lagoon will vary with the source of water quality as water from Herring Lagoon produces significantly more sludge than the water from bore fields.

The SKM assessment concluded that whilst the intent to source higher quality raw water is appropriate, a primary cost driver has not been established and the decision making process is not completed. As prudency is yet to be established, the efficiency of the project cannot be assessed. Consequently, the capital expenditure budget was not approved.

It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information should include:

- Confirmation from DERM regarding the ability to transfer existing water extraction licences
- Information regarding the choice of pH correction chemical compound
- A detailed scope of works
- Information indicating the capacity of the sludge lagoon with accompanying justification and preliminary drawings
- A cost breakdown of Seqwater's supply and install costs for the lime dosing configuration

It is noted that a response from DERM is not expected until February 2013 at the earliest. Consequently Seqwater should review the requirements of the current North Stradbroke Island facility to determine if any actions are required and whether they are required for either contingency outcome.

The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission.

B.2.4 Gold Coast Desalination Plant – Autoflush of SAF Pumps and Headers

SEQ Water Grid Manager comments Section 5.10

Seqwater has proposed to undertake upgrades of the Gold Coast Desalination Plant to enable "autoflush ofSAF pumps and headers", at a cost of $1.98 million. There is no reference to these works being required in 2012-13 in the interim statement from Seqwater to the Queensland Water Commission, dated 28 February 2012.

The Water Grid Manager requires further information before it can comment on the need for this expenditure.

The desalination facility is required to continue operations in stand-by mode. While maintaining availability, expenditure on upgrades should be minimised.

From the provided information by Seqwater, it is apparent that the auto flush of the SAF pumps and headers is a requirement of the direction to maintain the facility in hot standby mode. The SKM review assessed the project as prudent and efficient, but notes that additional scoping works are required.

The manual element of the above project have been agreed as part of the alliance construction contract, however the automation with reduce deterioration of the works is not within the scope of the construction alliance.

An additional review, possibly ex post review, should be completed at an appropriate time. It is anticipated that Seqwater would seek this after the scope is confirmed but before implementation.

The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission.

B.2.5 Lowood Water Treatment Plant

SEQ Water Grid Manager comments Section 5.16

Seqwater has proposed to undertake sludge handling improvements and other works at the Lowood Water Treatment Plant, at an estimated combined cost of $3 .3 million. The works are proposed to be undertaken in 2012-13 and 2013-14. The submission states that these upgrades are required for compliance purposes, but does not provide any further information.

There is no reference to these works being required in 2012-13 in the interim statement from Seqwater to the Queensland Water Commission, dated 28 February 2012.

The Water Grid Manager recommends that further information is required to demonstrate the need for this expenditure.

The treatment capacity of the Lowood Water Treatment Plant exceeds forecast mean day maximum month demand to the year 2031, and potentially beyond. Average day demand is about 7 ML per day, compared to the treatment capacity and entitlement of 20 ML per day.

If sludge handling improvements are shown to be required due to environmental legislation or to maintain supply, the equipment should be sized for no more than the predicted average demand at 2031 of 8.4 ML per day based on medium growth.

There are also no known water quality or reliability issues.

From the information provided by Seqwater, the following outcomes of the SKM reviewed were concluded:

- The project is assessed as prudent. The primary driver of compliance has been demonstrated and an appropriate decision making process has been documented
- The project is not sufficiently progressed to demonstrate the selection of an efficient option. Similarly the scope and standard of works are not defined

- Consequently the continued investigation is prudent however the capital expenditure of the solution can not be confirmed as efficient

To enable an assessment to be completed the following information is required:

- Options Assessment report including costs
- Tender review report for engagement of consultant for Options Assessment
- Business Case
- Information on project timeline

The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission.

The outcome of Seqwater's investigations could be affected by the SEQ Water Grid Manager submission.

B.2.6 Molendinar and Mudgeeraba water treatment plants

SEQ Water Grid Manager comments Section 5.5

Seqwater has proposed upgrades to the Molendinar and Mudgeeraba water treatment plants to be undertaken over 2012-13 to 2014-15, at an estimated combined cost of $22.9 million. The submission to the Queensland Competition Authority states that the scope of the Molendinar Water Treatment Plant upgrade is a backwash pump. The scope of Mudgeeraba Water Treatment Plant upgrade is a 20 ML storage. The submission states that these upgrades are required for compliance purposes, but does not provide any further information.

The Water Grid Manager considers that the current treatment capacities of the Molendinar and Mudgeeraba water treatment plants are adequate, based on this mode of operation. It does not foresee a requirement to increase those capacities at any time in the foreseeable future. It notes that the combined treatment capacity of the two plants exceeds both the entitlement, and average Level of Service contribution from Hinze Dam.

In operating the Water Grid, we will continue to use the Molendinar and Mudgeeraba water treatment plants as the primary sources of supply for the Gold Coast region and to the Southern Regional Water Pipeline, as summarised in Section 3. This supply will continue to be augmented by the Gold Coast Desalination Plant during peak demand periods, and when supply from the other plants is constrained, including during maintenance. When appropriate, it will also be augmented by supply from central South East Queensland via the Southern Regional Water Pipeline.

The Water Grid Manager notes that population growth may cause the capacity of the Molendinar and Mudgeeraba water treatment plants to be exceeded, as was flagged in the 2010-11 Annual Market Rules Review and the 18 January 2012 advice to the Queensland Water Commission. However, to the extent that this occurs, the additional or excess demand will be supplied from alternative supplies operating within their existing capacity.

In relation to water quality, the Water Grid Manager notes that the Seqwater submission refers to "changes to certain water quality parameters". To clarify, these statements refer to a trial of increased disinfectant dosing rates that was requested by our customer, Allconnex Water. The increased dosing rates are being delivered using existing infrastructure. The trial has not yet confirmed a need for the change to take place on a permanent basis, or that capital expenditure would be required to maintain the dosing rates that are currently being delivered from existing infrastructure.

The Water Grid Manager also notes that a total of $2.7 million of other works is proposed to be completed at the two water treatment plants in 2012-13. It understands that some of these works will address operational issues identified by Allconnex Water in relation to excessive pressures and fluoridation at the M04 Pump Station at the Molendinar Water Treatment Plant complex. With that exception, the Water Grid Manager does not have sufficient information to comment on the need for these other works.

Based on the information provided by Seqwater, the SKM review concluded that:

- Prudency is yet to be established however it is prudent to conclude the options assessment in order to determine the most appropriate path forward. An appropriate decision making process has been documented to date, including the commissioning of a comprehensive options study
- Efficiency has not been assessed as prudency is yet to be established
- Capital expenditure for 2012/13 has not been approved

From the two pages of the KBR report available for review the augmentation options have been deduced. It was noted that for Molendinar Water Treatment Plant a minimum capacity upgrade of 45 ML/day was inferred.

To enable an assessment to be completed the following information is required:

- Advise details of completion of Options Assessment
- Provide Options Report
- Advise date of approved Business Case
- Provide Business Case

Similarly for the Mudgeeraba Water Treatment Plant:

- Prudency is yet to be established however it is prudent to conclude the options assessment in order to determine the most appropriate path forward. An appropriate decision making process has been documented to date, including the commissioning of a comprehensive options study.
- Efficiency has not been assessed as prudency is yet to be established.
- Capital expenditure for 2012/13 has not been approved

To enable an assessment to be completed the following information is required:

- Advise details of completion of Options Assessment

- Provide Options Report
- Advise date of approved Business Case
- Provide Business Case

The project appears to be behind schedule. This may be the reason for the different perspectives from Seqwater and the Water Grid Manager. Based on the undertaking by Seqwater to interact with SEQ Water Grid Manager regarding capacity augmentation, it is expected that the SEQ Water Grid Manager will be involved in discussion.

The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission.

The outcome of Seqwater's investigations could be affected by the SEQ Water Grid Manager submission.

B.2.7 Beaudesert Water Treatment Plant

SEQ Water Grid Manager comments Section 5.7

Seqwater proposes to upgrade the Beaudesert Water Treatment Plant at an estimated cost of $9.0 million, with $2.5 million to be undertaken in 2012-13. The submission to the Queensland Competition Authority states that the capital expenditure relates to an upgrade of the plant for compliance purposes, including raw water infrastructure.

The proposed capital expend iture presupposes the outcomes of a planning study that is being undertaken for Canungra and Beaudesert, led by the Queensland Water Commission and involving all relevant stakeholders. The Water Grid Manager considers that planning investigations in relation to whether the preferred option is either a pipeline connection to the grid or a local water treatment plant should be concluded, and a preferred strategy for servicing the Canungra and Beaudesert townships agreed by all parties, prior to any significant capital expenditure being undertaken.

In either ca se, the Water Grid Manager does not consider that there is a need for expenditure in 2012-13 to make additional capacity ava ilable, based on current demand and information made available through the planning process. We also con sider any bulk water supply works should be triggered based on actual demand, enabling work to be staged. This would enable the deferral of major capital expenditure for as long as possible to enable actual growth rates to be more accurately assessed.

The Water Grid Manager notes that the interim statement from seqwater to the Queensland Water Commission, dated 28 February 2012, states that seqwater would await the outcome of the planning process before then making appropriate determinations regarding its assets. However, seqwater also states that it may determine that expenditure is required due to issues associated with asset condition or the meeting of peak demand capacities as differentiated from average demand.

The Water Grid Manager notes that it has undertaken a demand assessment for the purposes of the planning study, including of peak demand. The results of that asse ssment were provided in its *previous advice to seqwater and the Queensland Water Commission, including in our document entitled Beaudesert and Canungra: Service Specifications (see Attachment 6).*

We note that our previous assessments identified the potential for raw water quality risks. We understand that some limited capital expenditure may be required in 2012-13 to reduce those risks until the planning study is concluded, without increasing treatment capacity to more than 4 ML per day. However, we also note that the those risks have not been reflected in subsequent planning reports or in the results from water quality testing undertaken over the last 18 months - including during the major flooding events of January 2011.

No information was received by SKM regarding this project. The may be a result of the project not being sufficiently progressed, although it was expected that this initial phase would have been completed by March 2012.

Consequently, the SKM review concluded:

- The prudency of this project is yet to be established; however it is prudent to complete the options assessment in order to determine the most appropriate path forward. An appropriate decision making process has been documented to date, including the commissioning of a comprehensive options study
- Efficiency has not been assessed as prudency is yet to be established
- No capital expenditure in 2012/13 has been approved

It is recommended that sufficient additional information is provided by Seqwater to enable a complete assessment. This information should include:

- Confirmation of the cost driver
- Needs analysis
- Options analysis, including scope, costs and timeframes

The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission.

The outcome of Seqwater's investigations could be effected by the SEQ Water Grid Manager submission

B.2.8 Boonah-Kalbar Water Treatment Plant

SEQ Water Grid Manager Comments Section 5.15

Seqwater has proposed to upgrade the Boonah-Kalbar Water Treatment Plant at an estimated total cost of $9.3 million, to be undertaken from 2012-13 to 2014-15. The submission states that these upgrades are required for compliance purposes, but does not provide any further information.

This project is referred to in the interim statement from Seqwater to the Queensland Water Commission, dated 28 February 2012. That statement includes advice that the project will address the *key drivers of water quality and supply reliability, and peak capacity demands. It also states that total costs are estimated to be $5.3 million.*

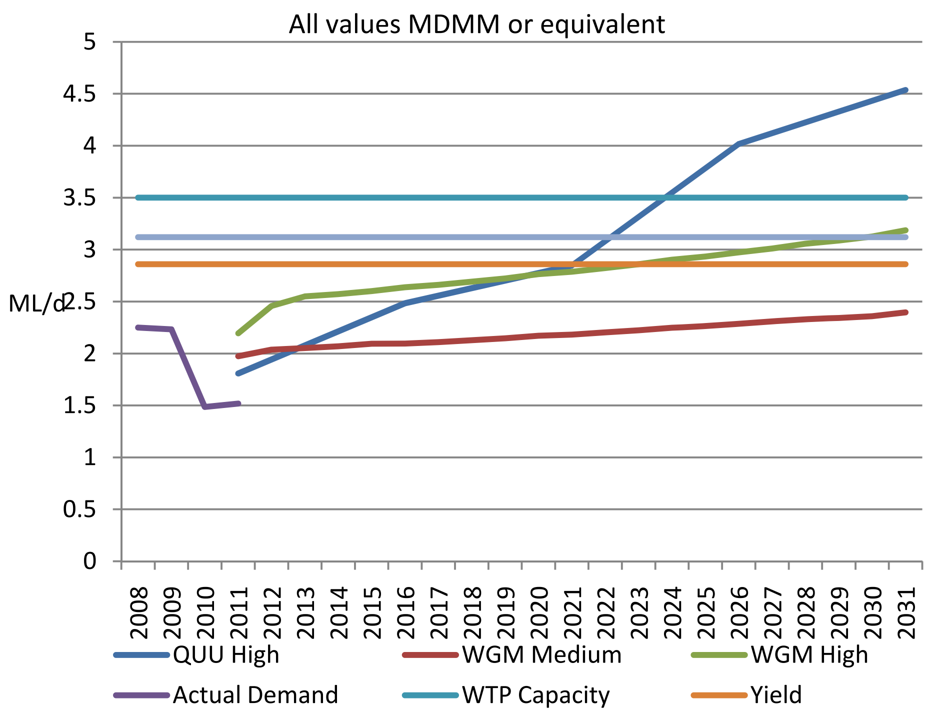
The Water Grid Manager recommends, based on current information, this capital expenditure is not required at this time.

The existing treatment capacity of 3.5 ML per day exceeds forecast demand over the short to medium term. For comparison, the forecast annual requirement for 2011-12 is 632 ML (about 1.7 ML per day). The mean day maximum month demand is about 50% of available treatment capacity.

*Augmentation options should be investigated for delivery when required. The trigger to undertake those works should be when average annual demand exceeds around 3 ML per day equivalent, depending upon the preferred option. This is not expected until 2021 at the earliest, for 2024 implementation. Figure **16** illustrates the impact of alternative demand scenarios upon the need for upgrades.*

There are no known water quality or reliability issues at the Boonah-Kalbar Water Treatment Plant.

***Figure 16:** Predicted demand and supply (MDMM or equivalent).*



Based on the information provided by Seqwater, a compliance issue regarding raw water quality was identified and a capacity issue was identified. Project 1, intake of raw water from a new and upstream location, addresses the compliance issue whilst Project 2 addresses the capacity issue.

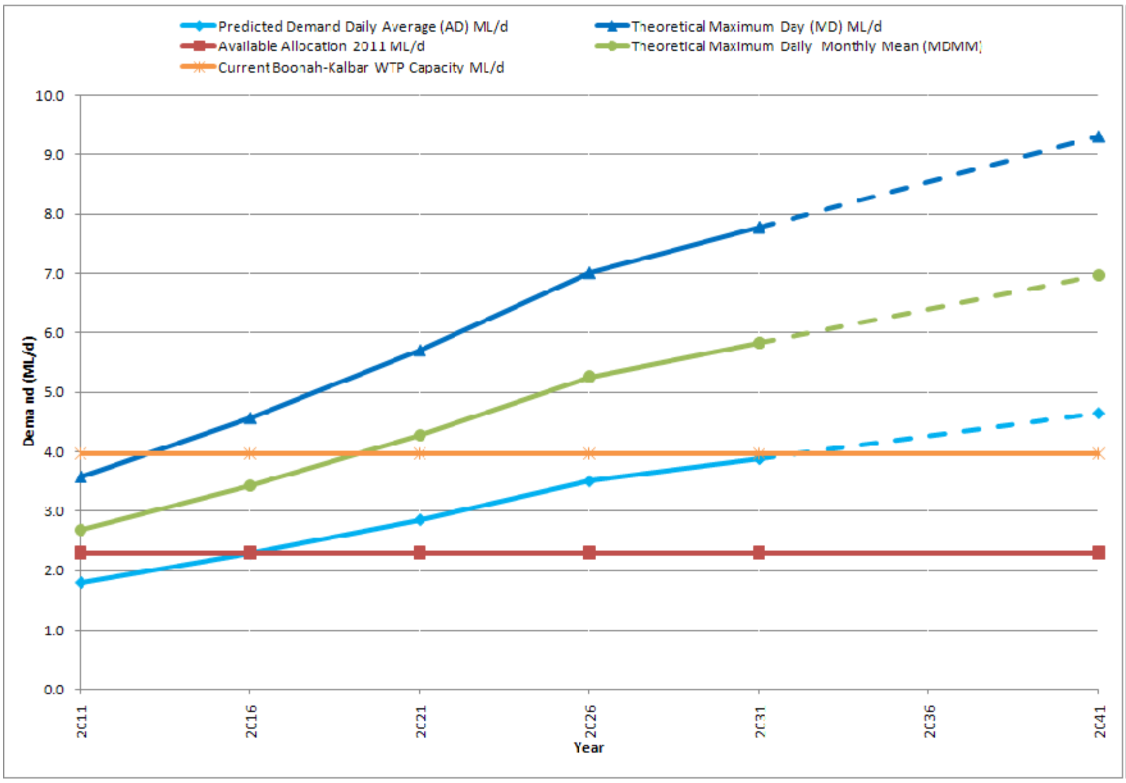
Based on the amount of water stored within Moogarah Dam and the Worill Creek system demand requirements, the reliability of supply is not an immediate issue.

With regard to capacity, whilst the plant has a nominal capacity of 4 ML/d, it can only reliably be operated when atttended and consequently has an effective capacity of 1.6 to 2.0 ML/day based on 8 – 10 hour shifts.

From the graph included within the SEQ Water Grid Managers submission, the average day demand is 1.5 ML/d to 1.6 ML/d and the MDMM would therefore be in the order of 2.24 ML/d. This illistrates that based on 8-10 hours operation, the facility is capacity constrained. The automation of the plant is the basis of Project 2 to allow increased operational capacity.

The following figures and tables from the information provied by Seqwater illustrate the projected demands, raw water quality sample results and treated water summary results.

- **Figure 19 Water Demands and Boonah – Kalbar Water Treatment Plant treatment capacity**



Note that water demands depicted by solid lines based on SRRC projections, whereas water demand depicted by dashed lines based on population estimation only.

- **Table 196 Raw Water Quality (samples from 2009 – 2011)**

Parameter	No. of samples	95th percentile	Average	Max-min	ADWG
pH	80	7.7	7.5	7.8-4.6	<6.5->8.5
True Colour (HU)	79	110	39	190-5	<15 (A)
Turbidity (NTU)	79	45	12.5	140-2.3	<5 (A)
Conductivity (µS/cm)	19	580.3	364	637-90	<780
Total Dissolved Salts (mg/L)	19	371	233	408-58	<500
E.coli (cfu/100mL)	80	712	656	39,000-27	None detected

Parameter	No. of samples	95th percentile	Average	Max-min	ADWG
Total coliforms (cfu/100mL)	80	24,000	10,487	240,000-470	None Detected
Manganese (total) (mg/L)	80	0.21	0.11	1.4-0.008	<0.5
Iron (total) (mg/L)	19	1.61	0.81	6.2-0.17	<0.3/<0.1
Chloride (mg/L)	3	123	74	130-35	<250 (A)
Geosmin (taste and odour)	2	7.45	5.2	7.7-2.7	<5
2-methylisoborneol (MIB) (ng/L)	2	28.0	19.7	29-9.7	<5

Parameter	Unit	Sample results				Seqwater specifications			ADWG
		Count	Median	95^{th}%ile	Maximum	Operating Target (median)	Action Limit (96^{th}%ile)	Notification Limit	
pH		80	7.2	7.51	8.2	7.6-8.5 (90^{th} percentile)	HACCP critical limit (6.5-8.5)	HACCP critical limit	6.5-8.5
Hardness (as $CaCO_3$)	mg/L	9	100	132	140	60-140	ADWG	ADWG	<200
DOC	mg/L	3	4	4.9	5	2	<3	NA	NA
True colour	HU	80	2	3	3	<2	5	>5	<15
Turbidity	NTU	80	0.17	0.36	0.55	<0.3	<0.5	>0.5	<5
Total coliforms	detection/100mL	80	<1	NA	NA	Detection	Detection	Detection	Detection
E. Coli	detection/100mL	80	<1	NA	NA	Detection	Detection	Detection	Detection
Conductivity	µS/cm	19	424	709	773	NA	<500	>500	~780
TDS	mg/L	19	271	454	495	NA	NA	NA	500
Disinfection by-products (as represented by THMs)	µg/L	19	33	74	102	<100	150	>150	>250
Fluoride	mg/L	113	0.8	0.94	1.0	0.8	0.7-09	>1.2	>1.5
Alkalinity	mg/L	19	88	111	120	>50	NA	NA	NA
2-methylisoborneol	ng/L	2	8.8	13.48	14	<2	>5	>10	Acceptable to most people
Aluminium (acid soluble)	mg/L	79	0.051	0.131	0.19	<0.05	0.1	NA	>0.2
Iron (total)	mg/L	80	<0.01	NA	NA	<0.05	0.15	>0.15	>0.3
Manganese (total)	mg/L	80	0.005	0.036	0.12	<0.005	0.02	>0.02 for 3 consecutive days or >0.04 for any day	>0.1 (A) >0.5(H)
Legend: Samples meet specification; Samples do not meet specification									

- **Table 197 Summary of treated**

Boonah Kalbar is a standalone Water Treatment Plant and can not rely on supply from other plants to provide water to meet peak demands. In addition there is no other source to provide water for mixing to dilute the product water to manage any taste and odour issues.

The SKM review assessed Project 2 as prudent but did not have sufficient information to confirm the efficiency.

With regard to Project 1, the project was assessed as prudent due to the non compliance. The project was also assessed as efficient.

Finally, another project, Project 3 which is associated with sludge treatment was assessed as prudent, but did not have sufficient information to confirm the efficiency.

The SKM review identified the following additional information is required to allow efficiency assessment of Projects 2 and 3:

- Finalised investigations with costs and timeframes

Consequently only $ 2,500,000 was approved for capital expenditure in 2012/13 being part of the staged development of Project 1 (2 year project). No budget was approved for Project 2 or 3 until additional information is supplied and reviewed.

The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ Water Grid Manager submission.

The outcome of Seqwater’s investigations could be effected by the SEQ Water Grid Manager submission.

B.2.9 Summary

- **Table 198 Summary of outcomes**

Project	Outcome
Kilcoy Upgrade	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ WGM submission.
Jimna Upgrades	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ WGM submission.
North Stradbroke Island Upgrades	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ WGM submission.
Gold Coast Desalination Plant Autoflush of SAF Pumps and Headers	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ WGM submission.
Lowood Upgrades including sludge handling improvements	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ WGM submission. The outcome of Seqwater’s investigations could be effected by the SEQ WGM submission.
Molendinar Upgrade	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ WGM submission. The outcome of Seqwater’s investigations could be effected by the SEQ WGM submission.
Mudgeeraba Upgrade	The conclusions of the SKM Grid Service Charges 2012/13 review are

Project	Outcome
	not varied as a result of the SEQ WGM submission. The outcome of Seqwater's investigations could be effected by the SEQ WGM submission.
Beaudesert Upgrade	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ WGM submission. The outcome of Seqwater's investigations could be effected by the SEQ WGM submission.
Boonah Kalbar WTP Upgrade	The conclusions of the SKM Grid Service Charges 2012/13 review are not varied as a result of the SEQ WGM submission.

The review of the SEQ Water Grid Manager submission did not vary the conclusions of any of the 9 sample projects.

SINCLAIR KNIGHT MERZ

SKM