



AQWEST- BUNBURY WATER BOARD |

Asset Management Review Report

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Report for: **Aqwest Bunbury Water Board**

PREPARATION, REVIEW AND AUTHORISATION

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Draft	19/11/07	HB	DU	Dean Illingworth
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SMEC Australia
6/12 St Georges Terrace
Perth WA 6000
Tel: 08 9323 5900
Fax: 08 9323 5901
Email: www.smec.com.au

Aqwest Bunbury Water Board
PO Box 57
Bunbury WA 6280
Tel: 08 9781 0500
Fax: 08 9754 1075
Email: www.aqwest.wa.gov.au

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Executive Summary

Introduction

Aqwest (Bunbury Water Board) supply potable water to the township of Bunbury, under an operating licence granted under section 3 of the *Water Services Licensing Act 1995* (Act).

Section 36 of the Act, and clause 6 of the attachment to Aqwest's Operating Licence, require Aqwest to provide and maintain an asset management system in respect of its assets. The system must set out the measures to be taken by Aqwest for the proper maintenance of its assets and for the undertaking, maintenance and monitoring of its water services works.

The Act further requires Aqwest to provide the Economic Regulation Authority (ERA) with a report by an independent expert on the effectiveness of the asset management system.

Aqwest with the approval of the ERA has commissioned SMEC Australia to undertake a review of their asset management system to assess Aqwest's level of compliance with the conditions of its Licence. This report documents the finding of the review.

SMEC wishes to acknowledge and thank the CEO of Aqwest and staff during their input and support for the audit process.

Objectives and scope of review

The scope of the operational audit was to assess Aqwest's systems and effectiveness of processes used to ensure compliance with the standards, outputs and outcomes which are:

- Referred to in Aqwest's operating licence; and
- Applied to Aqwest's operating licence, including those standards prescribed under section 33 of the *Water Services Licensing Act 1995*.

The scope of the asset management review is to provide an opinion to the authority on whether Aqwest has in place the appropriate systems for the planning, construction, operation and maintenance of its assets. The review examined:

- The adequacy of the asset management system by considering the outputs of the system, such as the operations and maintenance plans, asset registers and financial plans;
- The effectiveness of the asset management system by considering the systems established for the planning, construction, operation and maintenance of the works;
- The identification, development and implementation of strategic initiatives to improve the effectiveness of asset management; and
- Aqwest's response to the recommendations made in the previous reviews.

The review focused on identifying those aspects of the asset management system that could be further strengthened, with the view to providing feedback to Aqwest on the adequacy and effectiveness of the system.

Time Frame of the Review

The audit and review covered a period from the 31st October 2004 to 31st October 2007.

Overview of Asset Management System Review

TABLE 1. SUMMARY OF ASSET MANAGEMENT REVIEW

Activity	Description	Effectiveness Scale
Asset Planning	Provision for planning associated with the identification of assets and their long term management. Identification of appropriate service levels, options (including non-asset options), lifecycle costs, funding and consequences of failure are considered.	4
Asset Creation / Acquisition	Assessment of the policies and procedures around the creation and acquisition of assets.	4
Asset Disposal	Assessment of the policies and procedures around the disposal of assets. Is the usefulness of the assets reviewed on a regular basis?	4
Environmental Analysis	Environmental analysis examines the asset system environment and assesses all external factors affecting the asset system including compliance with service standards, investigation of breaches and corrective actions taken. Examination of the reporting and monitoring tools.	4
Asset Operations	Asset operations examine the policies and procedures covering the operation functions of the Board's assets. Issues to be examined include adequate resourcing, documentation of maintenance and testing procedures, recording and analysis of costs and the application of corrective actions.	5
Asset Maintenance	Assessment of the policies and procedures covering maintenance functions. Confirm that the policies are being followed, including maintenance schedules and analysis of costs.	4
Asset Management Information System	Assess the adequacy of policies and controls covering the computer systems. Confirmation that reports on standards / Licence obligations are being reviewed and acted on.	4
Risk Management	Risk analysis involves the identification of risk and management within an acceptable level of risk. Contingency plans document the steps to deal with the unexpected failure of an asset. Assessment based on the adequacy of policies and procedures, application of risk management and understanding of the staff.	4
Contingency Planning	Contingency Plans provide an indication of how well prepared the organisation is in respect to unplanned emergencies. Contingency plans document how the organisation responds, levels of responsibility and communications within the organisation and externally.	3
Financial Planning	The financial planning component of the AMP brings together the financial elements of the scheme to ensure its financial viability over the long term. Since capital investments tend to be large and lumpy, projections would normally be expected to cover at least 10 years, preferably longer. Projections over the next five years would be based on firm estimates.	4

Capital Expenditure Planning	The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure on each, over the next five or more years. This can be expressed as a schedule of projected annual expenditures offset by possible income from asset disposal, supported by documentation of the reasons for the decisions and evaluation of alternatives and options.	3
Review of AMS	Review of the Asset Management System assists to ensure the effective development and operation of Asset Management Plans. Determine when the plan was last updated and reviewed.	4

Asset Management System Review Conclusion

The Asset Management Plan (AMP) that Aqwest have in place is considered to be a well developed system and one that is undergoing further development and improvement. Aqwest have undertaken a number of recent reports and investigations that further strengthen the AMP.

Senior Staff have a positive attitude towards Asset Management and have developed a well considered set of documents and systems to support the system. The staff still see room for improvement. Senior Staff also encourage and promote asset management through all levels of the organisation.

Overall the audit found that previous asset management related recommendations have been addressed and that the system provides both the consumer and government with a high level of surety. Whilst this audit did not find any non compliance issues, it has made some recommendations to assist Aqwest to make further improvements to it's AMP.

Two of the categories have efficiency ratings of 3 (Well Defined). This is a reflection that these areas are meeting requirements but have room for improvement. Undertaking of improvements will see these categories quickly move up at least one rating point. Recommendations have been made regarding these areas as well several others.

Post Audit Implementation Plan

This audit did not identify any non-conformances in respect to the asset management aspects that were audited. However the audit has identified a number of areas that would benefit from further improvement. These are detailed in the following post-audit implementation plans.

TABLE 2. ASSET MANAGEMENT IMPLEMENTATION PLAN

Process	Current Rating	Issue	Recommendations	Responsible Officer	Proposed End Date
Asset Planning	4	Limited amount of detail on proposed capital works projects. Documentation to be commensurate with cost of project.	For proposed capital works projects with a value greater than \$500K that a more comprehensive project justification report be produced.	Water Services Manager	July 08
Risk Management	4	Risk assessments undertaken by others not consistent with Aqwest format. Unable to directly transfer into the Aqwest Risk Register. Residual risk (risk remaining after treatment) has not been considered. This will confirm whether the treatment is effective in terms of both risk reduction and cost.	Future planning and investigation reports by consultants use the Aqwest risk format to enable transfer of any identified risks directly into the Risk Register.	Water Services Manager	July 08
			Ensure standardisation of the risk management process in terms of overall approach and documentation	Water Services Manager	July 08
			Extend the risk register to include evaluation of the residual risk (risk remaining after application of the proposed treatment).	Water Services Manager	Dec 08
Contingency Planning	3	Unable to identify full suite of contingency and action plans, whether they are current and when they are due for revision.	Develop a register of all contingency and action plans, including date of issue and time for revision.	Water Services Manager	March 08
Capital Expenditure	3	Capital and Financial Plans only extend for a period of 5 years. Extend to identify major expenditure that could impact in years 6 to 10, which can identify possible future shortfalls in funding or other financial implications.	Extend the capital plan to include projections on major projects for up to 10 years.	Water Services Manager	July 08

1 Introduction

In October 2007 SMEC Australia was awarded a consultancy by Aqwest (Bunbury Water Board), with the approval of the Economic Regulation Authority (the Authority), to undertake their Asset Management System Review. This review assessed the effectiveness of processes implemented by Aqwest to maintain assets used in the provision of water services and for the undertaking, maintenance and operation of water service works.

Following acceptance of the Review Plan by Aqwest and the Economic Review Authority, Howard Baldwin and Debbie Unwin undertook the on-site component of the audit and review on the 13-14th November 2007.

This report summarises the findings of the Asset Management Review and identifies areas of the asset management system that could be improved or enhanced.

2 Objectives and Scope

2.1 Asset Management Review

The *Water Services Licensing Act 1995* requires that Aqwest provide for and maintain an asset management system. The system must set out the measures to be taken by Aqwest for the proper maintenance of its assets and for the undertaking, maintenance and monitoring of its water services works. The Act further requires Aqwest to provide the Authority with a report by an independent expert on the effectiveness of the system.

The review will provide an opinion to the Authority on whether Aqwest has in place the appropriate systems for the planning, construction, operation and maintenance of its water services works. In reaching this opinion, the auditors examined:

- the adequacy of the existing asset management system by considering the outputs of the system, such as the operations and maintenance plans, asset registers and financial plans;
- the effectiveness of the existing asset management system by considering the systems established for the planning, construction, operation and maintenance of works;
- whether the system provides for the identification, development and implementation of strategic initiatives to improve the effectiveness of asset management;
- the adequacy of the risk management system, including the risk assessment and contingency planning;
- The Licencee's response to the recommendations made in previous reviews.

The review also focused on identifying those aspects of the asset management system which may be further strengthened, with the view of providing feedback to Aqwest on the adequacy and effectiveness of the system.

2.1.1 Timeframe

The audit/review was carried out on the 13-14th November 2007 and covered the period from 31st October 2004 to 31st October 2007. The previous audit covered the period from the 1st August 2002 to 30th October 2004.

2.2 Key Documents

The documents provided by Aqwest and reviewed in respect to this audit are listed in Table 3 below.

TABLE 3. SUMMARY OF ASSET MANAGEMENT REVIEW

Document Title	Consultant	Rev No,Date
Water Supply General Operations & Maintenance Manual	Aqwest	4 /Aug / 2007
Asset Management Manual	Aqwest	3/ Aug /20007
Reticulation System Operation & Maintenance Manual	Aqwest	2/ Sep /20007
Spencer WTP Operation & Maintenance Manual	Aqwest	3/ July /20007
Tech WTP Operation & Maintenance Manual	Aqwest	3/ Jul /20007
Hastie WTP Operation & Maintenance Manual	Aqwest	2/ Aug /20007
Irwin WTP Operation & Maintenance Manual	Aqwest	2/ July /20007
Skewes WTP Operation & Maintenance Manual	Aqwest	2/ Aug /20007
Reservoirs Operation & Maintenance Manual	Aqwest	2/ Aug /20007
Robertson WTP Operation & Maintenance Manual	Aqwest	3/ Aug /20007
Asset Management Plan 2007/2008	Aqwest	Current
Strategic Development Plan 2007/2012	Aqwest	June 2007
Capital Works Projects Review 2006-2007	Aqwest	Aug 2007
Board Report June 2007 – Financial And Capital Expenditure	Aqwest	13/ June /2007
Rick Management Manual	Aqwest	Oct 2007
Aqwest Disaster Recovery Plan	Aqwest	Feb 2007
Aqwest Pandemic Influenza Plan	Aqwest	April 2007
5 Year Information System Strategic Plan	Consulted	Dec 2006
Tech Reservoir Refurbishment Investigation, Recommendation and Design	GHD	Jan 2007
Report For Roberts, Mangles And Hastier Reservoirs : Slope Stability Investigation	GHD	May 2006
Leak Detection And Associated Services	Detection	June 2007
Aboriginal Heritage Survey	Brad & Goode	Jan 2007
Drinking Water Framework Review	Hunter Water	Sep 2006
Bunbury Groundwater Licence Report	Rockwater	Sep 2007
Water Supply Planning And Hydraulic Analysis	MWH	Feb 2006
Groundwater Analysis : Draft	MWH	Dec 2006
Water Treatment Strategy	Hunter Water	Dec 2005
Management Plans: Robertson WTP, Mangles Reservoir, Hastie WTP , Skewes WTP, Spencer St WTP, Irwin WTP, Glen Iris Prop WTP & Tech Prop Reservoir	Opus	June 2005
Corrosion Control Strategy	ICM	March 2006
Valve Maintenance Strategy	PB	March 2007
Construction Environmental Management Plan	KBR	March 2007
Design And Construction Guidelines	Aqwest	Nov 2006
Asset Information Capture Form, Form No. W383	Aqwest	-
Policy Manual	Aqwest	October 2007
Accounting Manual	Aqwest	April 2006
Project File – Scada System, File No. 646	Aqwest	-

2.2.1 Key Personnel

The key representatives participating in the audit were:

- Mr Brad Bevis Chief Executive Officer
- Mr Gary Hallsworth Manager Water Services
- Mr. Brian Granville Chief Financial Officer

The members of the audit team were;

- Howard Baldwin Chief Auditor 4.5 working days (1.5 days on site)
- Debbie Unwin Auditor 5.5 working days (1.5 days on site)

3 Risk Assessment

A risk assessment has been carried out prior to the review, to assess and identifying the risk that may adversely impact on the process and result in ineffective asset management.

TABLE 4. CONSEQUENCE RATINGS

	Rating	Examples of Non-Compliance			
		Supply Quality	Supply Reliability	Consumer Protection	Breaches of legislation or other Licence Conditions
1	Minor	Minor Public Health or safety issues. Breach of standards minor – minimal impact on customers	System failure or connection delays affecting only a few customers. Some inconvenience to customers.	Customer complaints procedures not followed in a few instances. Nil or minor costs incurred by customers.	Licence conditions not fully complied with but issues have been promptly resolved.
2	Moderate	Event is restricted in both area and time e.g., supply of service to one street is affected for up to one day. Some remedial action is required.	Event is restricted in both and time e.g., supply of service to one street is affected for up to one day. Some remedial action is required.	Lapse in customer service standards is clearly noticeable but manageable. Some additional cost may be incurred by some customers.	Clear evidence of one or more breaches of legislation or other Licence conditions and/or sustained period of breaches.
3	Major	Significant system failure. Life threatening injuries or widespread health risks. Extensive remedial action required.	Significant system failure. Extensive remedial action required.		

(Table 6, Appendix 1, Audit Guidelines, Electricity, Gas and Water Licences)

TABLE 5. LIKELIHOOD RATINGS

	Level	Criteria
A	Likely	Non-compliance is expected to occur at least once or twice a year
B	Probable	Non-compliance is expected to occur once every three years
C	Unlikely	Non-compliance is expected to occur once every 10 years or longer

(Table 7, Appendix 1, Audit Guidelines, Electricity, Gas and Water Licences)

TABLE 6. INHERENT RISK RATING

Likelihood	Consequence		
	1. Minor	2. Moderate	3. Major
A. Likely	Medium	High	High
B. Probable	Low	Medium	High
C. Unlikely	Low	Medium	High

(Table 8, Appendix 1, Audit Guidelines, Electricity, Gas and Water Licences)

TABLE 7. INHERENT RISK RATINGS

Level	Description
High	Likely to cause major damage, disruption or breach of Licence conditions
Medium	Unlikely to cause major damage but may threaten the efficiency and effectiveness of service
Low	Unlikely to occur and consequences are relatively minor

(Table 9, Appendix 1, Audit Guidelines, Electricity, Gas and Water Licences)

TABLE 8. ADEQUACY RATINGS FOR EXISTING CONTROLS

	Level	Description
3	Strong	Strong controls that are sufficient for the identified risks
2	Moderate	Moderate controls that cover significant risks; improvement possible
1	Weak	Controls are weak or non-existent and have minimal impact on risks

(Table 10, Appendix 1, Audit Guidelines, Electricity, Gas and Water Licences)

Priority Rating

Priorities have been rated on a scale of 1 to 5 with 1 being the highest priority and the lowest being 5.

TABLE 9. RISK ASSESSMENT

Asset Management Process	Consequence (1)	Likelihood (2)	Audit Priority Rating (3)
ASSET PLANNING			
Lifecycle costs not considered/predicted	2	C	Medium
Asset failure not predicted/built into planning process	2	B	Medium
Plans not regularly reviewed/updated	1	B	Low
ASSET CREATION/ACQUISITION			
New asset evaluations do not include lifecycle costs	2	C	Medium
ASSET DISPOSAL			
Under-utilised assets and under-performing assets not identified & examined regularly. Systems not in place to	1	B	Low
ENVIRONMENTAL ANALYSIS			
Compliance with statutory and regulatory compliance	3	B	High
Customer service levels not achieved	3	C	High
ASSET OPERATIONS			
Operation policies/procedure not in place/linked to	1	B	Low
No system to ensure operation costs measured and	2	C	Medium
Risk assessment not used to prioritise tasks	2	B	Medium
ASSET MAINTENANCE			
Systems not in place to ensure regular inspection and maintenance , linked to service levels	3	B	High
Systems not in place to measure/monitor maintenance	2	B	Medium
ASSET MANAGEMENT INFORMATION SYSTEM			
Information system not documented for operators	1	A	Medium
Appropriate security system not in place	2	B	Medium
RISK MANAGEMENT			
Risk management system not in place	3	B	High
Probability and consequence of asset failure not regularly	2	B	Medium
CONTINGENCY PLANNING			
Contingency plans not developed/reviewed	2	A	High
FINANCIAL PLANNING			
Financial plan does not provide sufficient prediction of future income and operational and capital expenses	3	C	High
System not in place to assess and deal with large variations between budget and actual	2	B	Medium
CAPITAL EXPENDITURE PLANNING			
Plan not linked/consistent with asset life and condition	3	B	High
System in place to adequately review and update plan	2	B	Medium
REVIEW OF ASSET MANAGEMENT SYSTEM			
System not in pace to regularly review/update AMP	1	C	Low

4 Review of Previous Review Recommendations

A review of the findings of the previous audit and review was carried as part of the current review. Of the 17 recommendations made only 7 of these related to the asset management review. All of these actions were found to be addressed and closeout is recommended for all applicable actions.

TABLE 10. SUMMARY OF PREVIOUS AUDIT RECOMMENDATIONS

Item No.	Recommendation	Action Taken
1	Define complaint	<i>Operation Audit- Not covered</i>
2	Implement customer complaint management procedure	<i>Operation Audit- Not covered</i>
3	Close out procedure for complaints	<i>Operation Audit- Not covered</i>
4	Establish communications log	<i>Operation Audit- Not covered</i>
5	Update Policy 4.22 Customer complaint procedure	<i>Operation Audit- Not covered</i>
6	Establish designated officer for dealing with complaints	<i>Operation Audit- Not covered</i>
7	Establish formal protocol for establishing customer complaints	<i>Operation Audit- Not covered</i>
8	Version number and date on customer charter	<i>Operation Audit- Not covered</i>
9	Update reporting format on complaint statistics	<i>Operation Audit- Not covered</i>
10	Update reporting format on complaint statistics to include statistics on written complaints	<i>Operation Audit- Not covered</i>
11	Investigate the use of alternative report generation systems from Mainpac	<i>Operational Audit- Not Covered</i>
12	Amend capital works proposal to include non asset solutions NPV analysis etc	<i>The capital work proposal from has been amended to include mention of non asset solution and NPV. Need to confirm this is carried out for all proposals. Recommend closeout</i>
13	Undertake comprehensive evaluation for major or high risk capital works projects	<i>Major projects are based on extensive reports (e.g. Tech Reservoir Refurbishment). Recommend Closeout.</i>

14	Complete post evaluation/completion reviews for all completed capital works projects	<i>Post completion evaluation review undertaken, also evaluation of contractor performance. Recommend closeout.</i>
15	Operation licence reports sent to the authority kept separately from other information	<i>System has been initiated to file and forward water quality and other KPI data separately. Recommend Closeout.</i>
16	Include risk assessment information on assets into Mainpac	<i>Condition assessments are carried out on major assets. The system has multiple points of supply and is fully interconnected. The failure of a single component will not jeopardize the supply or operation of the system. Undertaking risk assessments on individual assets is unlikely to identify any significant risks to the system. Recommend closeout.</i>
17	Controls used to mitigate risk should be documented in the risk management manual	<i>Risk management manual has a risk treatment schedule listing level of risk and actions. Recommend closeout.</i>

5 Asset Management Review

5.1 Asset Management Summary

For the Asset Management Review, the following scale was used in assessing each key area of the asset management system.

TABLE 11. ASSET MANAGEMENT EFFECTIVENESS SUMMARY

ASSET MANAGEMENT SYSTEM		Not Performed	Performed Informally	Planned and Tracked	Well Defined	Quantitatively Controlled	Continuously Improving
Process	Effectiveness Rating	0	1	2	3	4	5
Asset Planning							
Asset Creation / acquisition							
Asset Disposal							
Environmental Analysis							
Asset Operations							
Asset Maintenance							
Asset Management Systems Information System							
Risk Management							
Contingency Planning							
Financial Planning							
Capital Expenditure Planning							
Review of AMS							

5.2 Asset Management Observations

5.2.1 Asset Planning

Provision for planning associated with the identification of assets and their long term management. Identification of appropriate service levels, options (including non-asset options), lifecycle costs, funding and consequences of failure are considered.

Test	Comments	Effectiveness
Have the strategic objectives for assets been identified?	<p>A number of separate reports have been produced that examine the strategic direction for systems and individual components (water treatment plants) within the systems. These reports include:-</p> <ul style="list-style-type: none"> • Water Treatment Strategy Report, December 2005 (Hunter Water) • Water Supply Planning & Hydraulic Analysis, February 2006 (MWH) • Capital Works Plans 	4
Have the life cycle costs been considered?	<p>Life cycle costs have been considered on the larger projects / assets.</p> <p>Capital Works Program “Automation of Water Treatment Plants”, Trim File No. W6436 – examined operating costs and life costs.</p>	3
Have the service levels been defined and documented?	<p>Performance Indicators are listed on the Asset Management Plan (2007/2008) and on the Strategic Development Plan (2007/2012).</p> <p>Water Treatment Strategy (December 2005) also lists water quality service parameters.</p>	4
Has the need for new assets been determined and full project evaluation processes been followed, including comparative assessment of non-asset solutions?	<p>Water Supply Planning & Hydraulic Analysis, February 2006 (MWH) identified a number of options for meeting future growth and demand, including the assets required. The recommended option was detailed further including a program and scale of works required.</p> <p>Non asset solutions are considered but not necessarily documented.</p>	4
Have documents recording relevant details on the asset been collected?	<p>Bunbury has a series of well developed “Operations and Maintenance Manuals” for its key assets.</p> <p>The Asset Management Manual details the procedures for recording assets in both its financial and asset management systems.</p>	4
Does the plan clearly assign responsibilities and have these been	<p>Capital Works Plans identify a “Project Manager” and for larger projects includes details of the</p>	4

applied in practice?	<p>proposed "Project Team".</p> <p>Capital Works Project Review report (August 2007) includes comments on the delivery / performance of responsible parties (delivery of design by consultants, etc).</p>	
Does the planning process and objectives reflect the needs of all stakeholders and is it integrated with business planning?	<p>Stakeholder needs have been met by the production of a recent series of reports covering water treatment, upgrading of the reticulation system to meet future demands/growth and looking at the impact on groundwater from both a level and water quality aspect. The reports have included recommendations around the timing of upgrades and estimated costs, which have been included in the Asset Management Plan.</p> <p>Board reports also indicate actions taken to review and develop strategic plans covering a five year time frame.</p>	4

Overall Assessment:

4

Overall Comments & Recommendations:

Aqwest have undertaken a number of reports recently which has established a solid foundation in respect to setting strategic goals for the key issues of security of supply and maintaining water quality from its bores.

This is supported by recently developed maintenance plans (valve maintenance plan etc).

More comprehensive documentation would assist in supporting the capital works program in respect to major projects. However this should be considered for the higher projects with total values in excess of \$500K. For smaller scale capital works projects, the cost of producing a high degree of documentation is not justified.

Recommendation:-

- *For proposed capital works projects with a value greater than \$500K that a more comprehensive project justification report be produced.*

5.2.2 Asset Creation / Acquisition

Assessment of the policies and procedures around the creation and acquisition of assets.

Test	Comments	Effectiveness
Are acquired assets designed in accordance with appropriate water industry standards?	Current copy of “Design and Construction Guidelines” was viewed.	4
Are there appropriate project management processes in place for asset creation and refurbishment?	The “Asset Management Manual, August 2007, Version 3” provides details on processes around asset creation and maintenance.	4
Is there a documented procedure in place for the acquisition of both minor and major assets?	Query minor asset acquisition procedure – ie computer etc. Major assets are identified in the capital works program with an approved budget. Documents include “Capital Project Form” for each project. Accounting Manual includes asset acquisition procedures.	4
Do assets reflect the objectives identified in the asset creation/acquisition phase?	The “Capital Works Projects Review 2006-2007” includes sections for “Design Quality/Fit for Purpose” and “Contractor Performance” where details on the outcomes have been provided.	4
Are actual costs as predicted?	The “Capital Works Projects Review 2006-2007” includes in Section 3 (Project-By-Project Review) a table detailing budget against actual costs. Of the 15 No. projects listed as complete, 4 No. have been noted as being over budget generally in the order of 10%. One of the over budget projects was due to future works being brought forward.	4
Are the ongoing legal/environmental/safety obligations of the asset owner assigned and understood?	Aqwest have an understanding of the legal, environmental and safety obligations that govern the business and the area they operate in. Operations and Maintenance Manuals and other documents make reference to standards and regulations as do documents in the Aqwest Policy Manual.	3
Are commissioning tests documented and completed?	The “Asset Management Manual, August 2007, Version 3” in section 3.2.6 (Post Installation Procedures” details requirements around commissioning of new assets. Viewed SCADA commissioning test results (File 646).	4

Overall Assessment:

4

Overall Comments & Recommendations:

This area is satisfactory. No comments or recommendations.

5.2.3 Asset Disposal

Assessment of the policies and procedures around the disposal of assets. Is the usefulness of the assets reviewed on a regular basis?

Test	Comments	Effectiveness
Are there appropriate project management processes in place for the disposal of assets? Are disposal alternatives considered?	“Asset Management Manual, August 2007, Version 3” in Section 6.0 outlines the processes in the disposal of assets. This section poses a number of questions including the option of changing the assets utilisation level (eliminating the need to dispose of the asset).	3
Are there appropriate procedures in place to check the condition, utilisation and operation of assets?	“Asset Management Manual, August 2007, Version 3” in Section 2.1 discusses “The Asset Condition Monitoring Process”. The Operations and Maintenance Manual for individual assets (water treatment plants) includes inspection schedules and lists the documentation/records that are to be kept in respect to an assets condition.	4
Are the reasons for under-utilisation or poor performance critically examined and corrective action or disposal undertaken?	The “Water Treatment Strategy, December 2005” examined the performance of the water treatment plants and made a number of recommendations to both improve and maximise the performance of the plants. Works have been included in the capital works program (ie No. 3951, Aerator Upgrades at all WTPs).	4
Are disposed assets correctly recorded on the asset register?	Aqwest have a standard form (W383) for both the acquisition and disposal of assets. Viewed asset disposal procedure in the accounting manual.	4

Overall Assessment:

4

Overall Comments & Recommendations:

This area is satisfactory. No comments or recommendations.

5.2.4 Environmental Analysis

Environmental analysis examines the asset system environment and assesses all external factors affecting the asset system including compliance with service standards, investigation of breaches and corrective actions taken. Examination of the reporting and monitoring tools.

Test	Comments	Effectiveness
Have the performance requirements (availability of service, capacity, continuity, emergency response) been documented?	The “Asset Management Plan 2007-2008” and the “Strategic Development Plan 2007-2012” both list key audited performance indicators for the period 2005-2006, including target levels. The Asset Management Plan lists details for the years back to 2001-2002.	4
Are the asset system objectives documented?	“Asset Management Plan 2007-2008” lists “Key Result Area Objectives” including long term optimization, compliance with operating licences, review of systems and development of technical standards.	4
Have the opportunities and threats in the system environment been assessed?	Opportunities not identified or assessed. The “Risk Management Manual, October 2007” has identified and ranked a number of system risks.	3
Have the opportunities and threats been regularly reviewed?	Risks last reviewed in October 2007.	3
Are regulatory obligations and statutory/regulatory requirements documented?	Operations & Maintenance manual sets out some requirements for quality/ MOU with DoH . Table 3.1 General give performance requirements & Table G1 gives ADWG requirements.	4
Are the assets meeting the level of service required by users of the service?	The Key Performance Indicators for 2005-2006 are showing a high level of service. Compared to previous years, water quality complaints have decreased and the targets for key parameters have generally been exceeded (water quality, customer outage times, etc).	4
Is there a system in place to record the level of service?	Data is detailed on a number of documents including “Asset Management Plan 2007-2008” and the “Strategic Development Plan 2007-2012”	4
Do the assets meet regulatory requirements?	Yes.	4

Overall Assessment:

4

Overall Comments & Recommendations

Opportunities need to be considered and documented where available as part of the risk register. As this business is a sole supplier there are however likely to be few opportunities.

5.2.5 Asset Operations

Asset operations examine the policies and procedures covering the operation functions of the Board's assets. Issues to be examined include adequate resourcing, documentation of maintenance and testing procedures, recording and analysis of costs and the application of corrective actions.

Test	Comments	Effectiveness
Are the asset system components documented?	Mainpac lists all of the assets including using a unique identifier for each. There are also links to the GIS and other systems. Documentation includes age, condition (if known), history, costs and a replacement cost.	4
Has the asset performance and condition been assessed?	Yes. Above ground assets are inspected based on scheduled maintenance (work orders generated by the Mainpac system).	4
Does the AMP include an asset register and plans of asset system components?	Asset Register included in the Mainpac system. The Operations and Maintenance Manuals include diagrams of the systems they cover. The Asset Management Plan includes an example of an "As Constructed" water reticulation for the information of providers of new work.	4
Does the register record asset type, location, material and an assessment of assets physical/structural condition?	Yes. Refer to above.	5
Are systems in place to assess asset condition and practice efficiency?	The Operations and Maintenance Manuals include inspection schedules for their respective systems. Efficiency of the water treatment plants was assessed in the Water Treatment Strategy Report (as at the time of producing the report). Mainpac graphical interface allows key parameters for the reticulation system to be highlighted. The SCADA system is used by treatment plant operators to monitor the efficiency and operation of key mechanical plant.	4
Are actual assets and human resources appropriate for performance requirements?	Key Performance indicators are not showing any immediate issues in respect to maintaining performance requirements. Staff attitude survey is positive. Human Resource issues have been identified and included in the Risk Register. Regular tool box meetings are held to identify and discuss issues. Supervisors produce a works program which also identifies resources required and any shortfall in resources.	4
Are operational policies and procedures documented and linked to service levels	Refer to the various Operations and Maintenance Manuals (Version 3, July 2007). Manuals have been	4

required?	recently updated. Service levels have been listed in the “General Operations and Maintenance Manual”.	
Are operational costs for individual assets recorded and monitored?	Mainpac records a history for each asset including costs expended against the individual asset. Board reports include reporting on operational costs for various asset types only (not individual assets or groups).	5
Are operations staff provided with training that reflects their role, operational duties and responsibilities?	Operations staff are encouraged and provided with appropriate training as part of the National Training Package for water operators. Most operators have achieved training to at least Certificate 2.	5

Overall Assessment:

5

Overall Comments & Recommendations:

Aqwest has in place a number of good systems which are under continual improvement.

5.2.6 Asset Maintenance

Assessment of the policies and procedures covering maintenance functions. Confirm that the policies are being followed, including maintenance schedules and analysis of costs.

Test	Comments	Effectiveness
Are assets assessed for capability and deficiencies to meet performance requirements?	Efficiency of the water treatment plants was assessed in the Water Treatment Strategy Report (as at the time of producing the report).	4
Are practices covering operating rules and maintenance documented?	Operations and Maintenance Manuals cover both the automatic (where applicable) as well as manual operation control of assets. The manuals include both inspection and maintenance schedules.	4
Do maintenance plans cover preventative and corrective maintenance?	Maintenance tasks identified tend are considered to be “preventative” rather than “corrective” maintenance.	3
Do operation and maintenance practices reflect performance targets?	The maintenance manual outlines responsibilities in respect to ensuring that the operation of the asset meets the targets for performance indicators. To date key performance indicators and targets are being met.	4
Are costs measured and recorded?	Refer to the comments on the Mainpac system. Costs for individual assets are recorded and compared against current replacement cost. Board reports include reporting on operational costs for various asset types only (not individual assets or groups).	5
Are failures analysed and operations adjusted where necessary?	Past failures have lead to the investigation and report on the issue in more global sense. An example was a valve failure that led to the isolation of a large area resulted in the “Valve Maintenance Strategy” which identified the need to maintain valves on a regular basis.	4
Is the level of maintenance justified against replacement cost?	Refer to above. Mainpac provides details on historic costs and current replacement cost for comparison.	4
Has the asset been inspected?	Above ground assets are inspected.	4
Is the assets’ theoretical life known?	Yes. An “Asset Age Profile” is detailed on the “Asset Management Plan, 2007-2008”. The Asset Management Plan requires this to be updated following verification of its actual condition, which may lead to the theoretical life being changed in accordance with its condition, service rating and service	4

	potential.	
Does the assess management plan enable the prediction of asset deterioration and failure?	The Asset Management Manual has a procedure to assist with predicting asset condition and remaining life. Mainpac system includes age of asset and an estimated life, from which remaining life is calculated. System permits updating the remaining life to reflect service conditions.	4
Do the maintenance plans and operational plans relate to what is required to achieve the levels of service required of the system?	Operating and maintenance procedures provide an outline of the purpose and role of the asset in the system. The maintenance and operation requirements to achieve the required level of service relate directly to this role.	4

Overall Assessment:

4

Overall Comments & Recommendations:

This area is satisfactory. No comments or recommendations.

5.2.7 Asset Management Information System

Assess the adequacy of policies and controls covering the computer systems. Confirmation that reports on standards / licence obligations are being reviewed and acted on.

Test	Comments	Effectiveness
Is there an asset management information system in place?	Aqwest has in place the “Mainpac” asset management system (Version 6.0). The system is also linked to other software which provides a wider asset management system (graphical interfaces, etc).	5
Is there documentation for users and IT operators?	Operation manuals for Mainpac and other IT systems are available on line. Staff are sent to courses as necessary for training. Operations manuals include basic instructions on the use of the SCADA system for individual sites.	3
Is there a security system for data collected ie. physical and electronical?	Yes. Hard copy files are tracked. Confidential documents are kept in locked cabinets. All server files are backed up daily by tape (with the tape removed from site). Access to the system is by password only.	4
Is data, including key computation, validated/verified for accuracy?	Water quality data is verified by the supervisor/operator and the Water Quality Committee. Features in the software pick up out of range or extreme values and send out appropriate notifications/reports.	4
Are there adequate data back-up procedures?	Refer to above. All data is backed up daily by a tape system. The “Five Year Information Systems Strategic Plan, December 2006” has made some recommendations for improved data backup which are to be implemented in 2008.	4
Does the data recorded include descriptions of the asset and its history of operation?	Mainpac records data description, history and costs of operation and replacement cost for each asset.	5
Does the system produce reports that meet operating Licencee requirements?	The Water Quality program generates reports, including automatic notification of any non compliance. Mainpac identifies areas in the reticulation where there are a high number of complaints, water quality issues or main breaks.	4

Overall Assessment:

4

Overall Comments & Recommendations:

Aqwest have a program of upgrading their IT System based on the outcomes of an IT Strategic Report.

5.2.8 Risk Management

Risk analysis involves the identification of risk and management within an acceptable level of risk. Contingency plans document the steps to deal with the unexpected failure of an asset. Assessment based on the adequacy of policies and procedures, application of risk management and understanding of the staff.

Test	Comments	Effectiveness
Has a risk assessment of assets been conducted?	<p>The “Risk Management Manual, October 2007” is more focused on corporate risk rather than an individual asset. In the past the risk register has taken a more operational based approach, containing risk assessments on individual assets/tasks.</p> <p>The “Five Year Information Systems Strategic Plan, December 2006” includes a risk assessment of various IT components, but the format of the risk register is different to that in the risk management manual.</p> <p>Several reports on the condition of assets (Tech Reservoir and Hastie Reservoir) have included a hazard rating under the Dam Safety Assessment process, but this has not been transferred into the Risk Management Manual.</p> <p>Aqwest are currently upgrading their approach to risk management and risk register to reflect risks that can impact on the delivery and continuity of the business. Once this has been achieved it is intended to assess and document asset and then operational risks.</p> <p>The system has multiple points of supply and is fully interlinked and failure of an individual asset or group (water bore or water treatment plant) will have minimal impact on the system and as a result risk assessment of individual assets is unlikely to identify any high risk concerns, however the exercise should be documented in the risk register in future.</p>	3
Is there a current risk register?	Yes. Refer to “Risk Management Manual, October 2007”. This is currently undergoing further development.	3
Has the probability and consequences of asset failure have been identified?	For the risks identified in the “Risk Management Manual, October 2007”, all risks have been assessed for probability (likelihood) and consequence. Refer to above comments on assessing individual assets.	4
Is risk management practiced?	Risk Management is practiced. JSEA carried out by operations staff before the commencement of each task to identify and manage operational risks. The results of risk assessments carried out on individual assets are used in programming maintenance and renewal works. Risk register has been recently upgraded	4

	to a higher level with a stronger emphasis on business continuity.	
Where unacceptable risks have been identified have risk control measures been implemented?	Section 11.0 of the “Risk Management Manual, October 2007” is a Risk Treatment Schedule which details for selected higher risks the action required, responsible officer and a due date for the actions.	4

Overall Assessment:

4

Overall Comments & Recommendations:

Aqwest are currently undergoing the implementation of a new approach to risk management, thus the documents viewed represent a work in progress, which Aqwest intend to develop and expand on.

It is considered that the following recommendations would further improve this area.

Recommendations:-

- *Future planning and investigation reports by consultants use the Aqwest risk format to enable transfer of any identified risks directly into the Risk Register.*
- *Extend the risk register to include evaluation of the residual risk (risk remaining after application of the proposed treatment).*
- *Ensure standardisation of the risk management process in terms of overall approach and documentation*

5.2.9 Contingency Planning

Contingency Plans provide an indication of how well prepared the organisation is in respect to unplanned emergencies. Contingency plans document how the organisation responds, levels of responsibility and communications within the organisation and externally.

Test	Comments	Effectiveness
Are appropriate contingency plans in place? Have they been assessed and tested to determine their operability?	<p>There is an “Aqwest Disaster Recovery Plan, Updated February 2007” in place. The plan is generic but provides a detailed contact list.</p> <p>A detailed “Pandemic Influenza Plan, April 2007” has been produced which outlines roles, responsibilities and actions.</p> <p>Chlorine and Fire Drills are run on a regular basis.</p> <p>The Water Quality Committee conducts desk top simulations of water quality incidence management several times a year (next due in the next couple of months).</p>	3
When were the contingency plans last reviewed or updated?	Refer above. Plans reviewed were all dated 2007.	4
Have the contingency plans been tested?	Refer to above.	4
Where events that may result in severe consequences been identified and have contingency plans been developed?	Contingency plans developed as noted above. Further plans have been identified as being necessary.	3

Overall Assessment:

3

Overall Comments & Recommendations:

Need a register for all of the contingency plans. This will help identify any gaps.

Recommendation:-

- *Develop a register of all contingency and action plans, including date of issue and time for revision.*

5.2.10 Financial Planning

The financial planning component of the AMP brings together the financial elements of the scheme to ensure its financial viability over the long term. Since capital investments tend to be large and lumpy, projections would normally be expected to cover at least 10 years, preferably longer. Projections over the next five years would be based on firm estimates.

Test	Comments	Effectiveness
Does the Financial Plan provide projections of operating statements (profit and loss) and statement of financial position ?	The Board Report (13 June 2007) includes a 5 year operating statement (2006 to 2012) which includes estimates of revenue, other income, expenditure and retained profit.	4
Does the financial plan cover a period of at least 5 years, with projections for up to 10 years?	Plan covers the required five year period up to the year 2012. No evidence of any financial planning beyond 5 years except that noted in specific strategic planning reports on a project.	3
Does the financial plan cover the financial objectives and strategies and actions to achieve the objectives?	The financial plan includes the capital works items required to achieve strategies and objectives that have been identified. The financial plan also includes provision for future operations costs.	4
Does the financial plan identify the source of funds for the capital expenditure plan?	June 2007 Board Report identifies that source of funding is from capital reserves. A number of reserve funds have been set up.	4
Are the sources of funds for operation, maintenance and administration identified in the financial plan?	Operation, maintenance and administration costs are funded from revenue, including water sales and interest.	4
Does the financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period?	The Board Report (13 June 2007) includes a 5 year operating statement (2006 to 2012) which includes estimates of revenue, other income, expenditure and retained profit. No details provided on the period beyond 5 years.	4
Does the financial plan provide for the operation and maintenance, administration and capital expenditure requirements of the scheme?	Yes.	4

Overall Assessment:

4

Overall Comments & Recommendations:

Aqwest have in place a well developed system with financial planning out to 5 years. Consideration should be given to extending this to 10 years using appropriate indices to give indicative predictions.

5.2.11 Capital Expenditure Planning

The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure on each, over the next five or more years. This can be expressed as a schedule of projected annual expenditures offset by possible income from asset disposal, supported by documentation of the reasons for the decisions and evaluation of alternatives and options.

Test	Comments	Effectiveness
Has a capital expenditure plan been prepared?	Yes. Details for a 5 years plan included in the June 2007 Board Report. A summary is detailed on the "Asset Management Plan 2007-2008".	4
How frequently is the plan reviewed or prepared?	Annual.	4
What period does the plan cover?	Plan covers the next 5 years (up to the year 2012).	3
Does the plan cover the issues to be addressed, the actions proposed, the centre of responsibilities, and deadline dates?	A summary of the budget, timing, funding and general issues is included in the June 2007 Board Report. A more detailed plan for current capital projects is included in the "Capital Works Projects Review, August 2007". Deadlines and timeframes (trigger points) have been identified in the strategic plans.	3
Does the plan provide reasons for capital expenditure and timing of expenditure?	The introduction to the capital expenditure plan provides details of reasons and timing for capital expenditure. The June 2007 Board Report indicates that the reason for a large proportion of capital expenditure relates to meeting the outcomes of recent strategic reports around the issues associated with the current main sources of water supply being close to the coast and future saline infiltration in the aquifer.	3
Is the capital expenditure plan consistent with the asset life and condition identified in the AMP?	The capital expenditure plan includes provision for meter and water main replacement programs on an ongoing annual basis. Mainpac system identifies assets approaching their end of life date. Assets are then inspected and where necessary appropriate funding is planned for their replacement.	3

Overall Assessment:

3

Overall Comments & Recommendations:

Aqwest have in place a well developed system with planning out to 5 years. Some of the strategic plans include works in longer time frames and trigger points but these have not been included in the capital plan. Major capital works expenditure within the next 10 years should also be included in the capital plan. Consideration should be given to further developing documentation to support proposed capital projects, commensurate with the projects total cost (refer to comments in the Asset Planning section).

Recommendation:-

- *Extend the capital plan to include projections on major projects for up to 10 years.*

5.2.12 Review of Asset Management System

Review of the Asset Management System assists to ensure the effective development and operation of Asset Management Plans. Determine when the plan was last updated and reviewed.

Test	Comments	Effectiveness
Is a review process in place to ensure that AMPs are kept current?	Yes. The AMP is reproduced annually. Operations and Maintenance Manuals have been reviewed 3 times, the latest in 2007. The executive team documents include a comprehensive list of all AMP documents and their currency/review dates.	4
Are AMPs being reviewed at appropriate intervals?	Yes. Latest version of the Asset Management Plan is noted for review in July 2008.	4
Are the AMPs current?	All the documents reviewed were recent editions (within the last 2 years).	4

Overall Assessment:

4

Overall Comments & Recommendations:

This area is satisfactory. No comments or recommendations.

6 Recommendations

This audit did not identify any non-conformances in respect to the asset management aspects that were audited. However the audit has identified a number of areas that would benefit from further improvement. These are detailed in the following post-audit implementation plans.

The time frames proposed in the post-audit implementation plan reflect the fact that they relate to improvements rather than non-conformances. The time frames proposed take into account the need for the Board officers to maintain their current work practices and to undertake the recommended improvements over a period of time. They are intended to ensure that the product be a much more considered document rather than one that is rushed together.

Table 12 below outlines the Post Audit implementation plan.

6.1 Changes to the Licence

No changes to the Aqwest Operating Licence are proposed at this time.

TABLE 12. ASSET MANAGEMENT IMPLEMENTATION PLAN

Process	Current Rating	Issue	Recommendations	Responsible Officer	Proposed End Date
Asset Planning	4	Limited amount of detail on proposed capital works projects. Documentation to be commensurate with cost of project.	For proposed capital works projects with a value greater than \$500K that a more comprehensive project justification report be produced.	Water Services Manager	July 08
Risk Management	4	Risk assessments undertaken by others not consistent with Aqwest format. Unable to directly transfer into the Aqwest Risk Register. Residual risk (risk remaining after treatment) has not been considered. This will confirm whether the treatment is effective in terms of both risk reduction and cost.	Future planning and investigation reports by consultants use the Aqwest risk format to enable transfer of any identified risks directly into the Risk Register.	Water Services Manager	July 08
			Ensure standardisation of the risk management process in terms of overall approach and documentation	Water Services Manager	July 08
			Extend the risk register to include evaluation of the residual risk (risk remaining after application of the proposed treatment).	Water Services Manager	Dec 08
Contingency Planning	3	Unable to identify full suite of contingency and action plans, whether they are current and when they are due for revision.	Develop a register of all contingency and action plans, including date of issue and time for revision.	Water Services Manager	March 08
Capital Expenditure	3	Capital and Financial Plans only extend for a period of 5 years. Extend to identify major expenditure that could impact in years 6 to 10, which can identify possible future shortfalls in funding or other financial implications.	Extend the capital plan to include projections on major projects for up to 10 years.	Water Services Manager	July 08

The above asset management improvement plan has been developed by the auditor and has been agreed to by the Licencee (Aqwest).

7 Confirmation of the Audit

We confirm that the audit carried out at Aqwest in November 2007 and recorded in this report is an accurate presentation of our findings and opinions.

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Debbie Unwin

Auditor

12th December 2007

SMEC Australia Pty Ltd

12 St George Terrace

Perth WA