Asset Management System Effectiveness Review

Water Corporation Western Australia

February 2013

Odysseus-imc Pty Ltd
Infrastructure Management Consultants

Approval

FUNCTION	NAME	DATE	SIGNATURE
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EXECUTIVE SUMMARY

Water Corporation (WaterCorp) is required to undertake an asset management system effectiveness review (AMSER) not less than once in every period of 24 months (or such longer period as the Economic Regulation Authority allows) according to the Water Services Licensing Act 1995. Similar reviews have been undertaken in the past namely 2002, 2004, 2006 and 2009.

The outcomes of the 2012 review are identified in this report outlining the performance of WaterCorp with respect to asset management key processes as well as recommendations for improvement against each process where identified. It is further understood that the outcomes of the review are reported to the Economic Regulation Authority (ERA).

The time period covered by this review is 2009 – 2012. This report is an impartial review of WaterCorp's asset management effectiveness under the ERA guidelines.

The review conducted between 2nd July 2012 and 20th September 2012 examined the asset management processes used by the Water Corporation in delivering the services to its customers. On-site reviews were undertaken between 23rd to 26th July and 30th July to 2nd August respectively. The services to the customers include lifecycle processes for:

- Asset planning;
- Asset creation/acquisition;
- Asset disposal;
- Environmental analysis;
- Asset operations;
- Asset maintenance;
- Asset management information system (AMIS);
- Risk management;
- Contingency planning;
- Financial planning;
- Capital expenditure planning; and
- Review of the asset management system.

As well as the processes, the asset management supporting systems were tested as to their use and effectiveness. Data used by WaterCorp was also examined with respect to its effectiveness for asset management and the delivery of outcomes.

The recommendations identified in the previous review were examined and the outcomes included in this report.

Tests were undertaken through interviews and investigation of the processes to assess whether they were being performed as documented.

As a result of the 2012 Effectiveness Review the effectiveness rating for WaterCorp has been updated to reflect the current findings. It is felt that the ratings in the following table are appropriate for Water Corporation.

Asset Management System	Asset Management Process and Policy Definition Adequacy Rating	Asset Management Performance Rating
Asset Planning	B	2
Asset Creation/Acquisition	A	1
Asset Disposal	A	3
Environmental Analysis	A	1
Asset Operations	A	2
Asset Maintenance	B	2
Asset Management Information System	A	1
Risk Management	B	3
Contingency Planning	B	2
Financial Planning	A	1
Capital Expenditure Planning	A	1
Review of the AMS	A	1

TABLE 1 – ASSET MANAGEMENT EFFECTIVENESS RATINGS

The above ratings are based on the definitions in Table 5 and 6 of the ERA Audit Guidelines: Electricity, Gas and Water Licences – August 2010.

As a result of the review, the following recommendations have been identified to address the issues observed.

Rec. No.	Asset Management Process	Issue	Recommendation
	Asset Planning		
1	**Identification and inspection of planning process documentation**	The Renewal Planning Section is a recent development. Extensive effort has been applied to identify the approach to be taken for Renewal Planning. As such documentation is still to be developed.	Renewal Planning Section to develop supporting documentation such as: • Business case; and • Process manual.

Rec. No.	Asset Management Process	Issue	Recommendation
2		Asset management planning procedures are of varying state, quality and are out of date.	Asset management planning procedures objectives, purpose and content to be reviewed. All procedures to be updated in line with agreed approach. Procedure document needs to reflect current approach including asset renewal, strategy statements etc
3		Although great effort has gone into the development of the 'Our Plan, Monitor and Assess Asset Performance, Condition & Risk Story' the implementation of the story is vital to achieving the desired state.	Implement the 'Our Plan, Monitor and Assess Asset Performance, Condition & Risk Story' by setting clear target dates and responsibilities in order to achieve the desired result.
4	**Assess the adequacy of the asset management plans w/r to the planning process. Are the capital works and maintenance budgets aligned to the asset management plans?**	The Asset Management Branch is replacing Asset Class Plans with Strategic Statements.	Complete the remaining 17 Strategic Statements.
5		Supporting tools are needed to assist in the analysis process.	Improve the renewals forecasting of sewer mains (large and small) by obtaining an appropriate tool to undertake the analysis.
6		Supporting tools are needed to assist in the analysis process.	Improve forecasting of whole of life cost for mechanical and electrical assets by obtaining an appropriate tool.
7		Good quality data for strategic planning is not currently available.	There needs to be a joint effort by the central group and regions to improve quality and accuracy of data.
8		Good quality data for strategic planning is not currently available.	The data collection KPI's process needs to be re-initiated to ensure the collection of the data is undertaken in a timely manner.

Rec. No.	Asset Management Process	Issue	Recommendation
9	**Assess if the asset management plan is implemented in practice and assigns clear staff responsibilities.**	Current process for tracking improvements from asset class plans can be enhanced. A more robust process is required for the Strategic Statements.	Enhance the current improvement implementation process by setting clear target dates, assigning responsibilities and monitoring progress monthly in line with group meetings.
	Asset Creation and Acquisition		
10	**Test whether processes cover project evaluation and approval including non-asset options, life cycle cost considerations, engineering and business decisions, and commissioning of assets.**	The 'Assess Asset Capability' process analyses all relevant asset performance, condition and risk information, assesses options and initiates actions in time to ensure assets can meet future performance requirements and deliver service commitments to customers. The optioneering process comes in to play when an issue of capability has been identified as an emerging issue through the Assess Asset Capability. It is in effect the business case development stage where a range of options (including operational, capital, challenging of standards etc) are considered and evaluated to ensure that the most cost effective whole of life solution is being adopted. Optioneering will allow a broader project analysis to be undertaken at the high level e.g. instead of commencing a capital project to solve the problem, identify operational projects that may solve the problem or defer the need for capital. The Optioneering process will support identification of non-capital options as an alternative to a capital solution.	The Optioneering process to be implemented as a feed-in to the Asset Acquisition Process and that training includes raising awareness in relevant corporate branches and the regions.
	Asset Disposal		

Rec. No.	Asset Management Process	Issue	Recommendation
11	**Identify and review evidence related to performance of assets and reporting on underperforming assets. Determine the frequency of these reviews.**	The System Capability Framework (SCF) will enable ongoing monitoring of asset performance and will support timely and effective expenditure.	Finish the development of the SCF and implement across the corporation and regions as soon as possible
12	**Assess sample jobs and walk through processes. Is there a manual? Review availability and awareness in relation to the manual.**	The corporation does not have full knowledge of the assets to be disposed.	An audit programme should be established for assets requiring disposal across the corporation and regions.
13	**Assess the adequacy of the asset disposal processes.**	In discussions with WaterCorp personnel they expressed uncertainty about who was responsible for managing asset disposal.	Responsibility for asset disposal should be clearly identified in all situations e.g. post project disposal.
14		In discussions with WaterCorp personnel they expressed uncertainty about who was responsible for managing asset disposal.	All personnel involved in the asset disposal process should be trained in the process end to end.
15		Asset disposal appears to be undertaken in an adhoc manner in the Regions and as such there is the potential for assets identified as needing disposal may not be disposed.	Develop a 3 to 5 year rolling disposal programme that is monitored as per current programme processes. The programme should become part of the normal project business requirements where it can be reported against and monitored.
16	**Assess whether disposal alternatives are evaluated.**	The system capability matrix process will support identification of non-capital options as an alternative to a capital solution.	Complete the implementation of the system capability matrix.
	Environmental analysis		No Recommendations
	Asset Operations		

Rec. No.	Asset Management Process	Issue	Recommendation
17	**Assess the adequacy of training and testing of operator's ability to operate the infrastructure.**	While operational data is being captured, good quality data is not being captured to support operations. Additional training required in the field for system users to input and Asset Managers to use the data accessible through the current systems.	Extend current training to provide operators in the field with the importance of data collection, the role they play in asset management and how their job is important to the greater business outcomes.
18	**Review asset register for operations content e.g. operational procedures, activity and costs.**	Good quality data is not being captured to support operations. Based on the review gaps in the asset and asset attributes currently exist. Also the maintenance data being recorded in the region reviewed is inconsistent and difficult to interpret.	Asset related data capture should be embedded into normal operational activities of the system users and Asset Managers.
19	**Review effectiveness of the assets themselves.**	Currently critical control points are used to monitor the performance of the assets at the treatment plants. Critical control reports are generated weekly with a monthly view. Trends are reviewed with managers each week. The Aroona Alliance use Process Control Tables to compare operations against process control points. If results are different to set trigger points, an Asset Deficiency Report (ADR) is produced (typically mechanical and electrical equipment). Woodman Point WWTP is working towards also monitoring and reporting against Process Control Points. There is a desire to extend the monitoring of Process Control Points.	Work towards the monitoring of Process Control Points for all treatment plant.
20	**Check SCADA has been installed and implemented to monitor infrastructure performance, alarms occur on fault/failure and performance information is recorded, reported and analysed**	SCADA data is collected however a plan is needed that guides the use of this data for planning purposes.	Develop a plan on how to utilise SCADA data for all asset classes e.g. Data to be used, what purpose and what asset class. Incorporate use of Data Historian within the plan.

Rec. No.	Asset Management Process	Issue	Recommendation
	Asset Maintenance		
21	**Identification and inspection of procedural documentation.**	The current documentation process needs to be completed.	Continue to review and complete process documentation including maintenance standards and procedures.
22	**Test application of procedures over the review period.**	The maintenance standards are stored in a library (spreadsheet) and incorporated in SAP for new assets. 83% of the asset base is covered by the new generation maintenance standards. The current maintenance standards need to be completed.	Complete the maintenance standards for the asset base.
23		The current documentation process needs to be completed.	Document the process for incorporation of maintenance standards for new assets.
24	**Review evidence of inspections for asset performance and condition. Review condition manual for consistency of approach.**	The current process averages condition across assets with the risk that the condition rating may not reflect the actual results.	Review condition assessment process to ensure that the condition assessment does not skew the rating by averaging good and bad condition. E.g. ensure the current process isolates poor condition assets from the overall condition (Use of ADRs).
25	**Review effectiveness of the assets themselves.**	Dashboards are a useful and effective way of monitoring performance of the assets.	Continue the development of dashboards as the need is identified.
26	**Assess recording and reporting of reactive work orders, type of failure and cause of failure**	Fault mode analysis is being applied inconsistently. WaterCorp's current systems have been built to capture and feedback this data – Analysis of that data is an Asset Management accountability.	Formalise fault mode analysis and develop guidelines for data requirements and analysis.
27		Data is entered into the maintenance management system inconsistently resulting in poor quality supporting data. WaterCorp's current systems have been built to capture and feedback this data – Analysis of that data is an Asset Management accountability.	Improve the quality of data being fed back into the work orders by providing documented direction and support for maintenance personnel.

Rec. No.	Asset Management Process	Issue	Recommendation
28	**Review the information feedback loop after works are completed and asset information requires updating**	Good quality data is not being captured to support asset information and analysis.	Incorporate the data capture as part of planned maintenance and/or inspections as part of normal operations.
29	**During the site visits, physically inspect a sample of assets and review the adequacy of the asset's maintenance records and effectiveness of the asset maintenance undertaken during the review period**	Assets were inspected at Newman. Hydrants installed by BHP prior to handover to WaterCorp are American above ground hydrants. They are now exhibiting rusting failure where the riser meets the ground level. They are being replaced with standard hydrants as they fail. Inspections were being performed on the sewer manholes at the time of the visit. Inspection of the lids indicated a number of lids popping as a result of gas build up in the mains. The concrete in the lids was either cracking or breaking up as a result of upward pressures.	Repeat failures should be monitored and reported centrally. Should repeat failures demonstrate an ongoing trend, strategies should be developed to overcome the trends.
	Asset management information system (AMIS)		No Recommendations
	Risk Management		
30	**Identification and inspection of policies and procedures.**	It is recognised that improvements to the Asset Risk Assessment are required for it to be successfully applied in the Corporation.	Improve the process documentation supporting Asset Risk Assessment such as guidelines with examples, criteria matrix, links to planning process etc.
31	**View the risk register, select samples and review treatment plans that have been actioned and monitored.**	Corporate risks are not currently managed centrally in one risk information system.	On procuring the new Risk Information System (register) and in accordance with the risk management principles, existing and new corporate risk be consolidated into the new system.

Rec. No.	Asset Management Process	Issue	Recommendation
32	**Examine risk register to check if potential failures have been identified in the register. Review asset failures and failure rate. Has the risk rating been reviewed after the failure?**	It is not evident that risk ratings have been reviewed after the asset failure.	When a failure is recorded and subsequently completed the risk review should be undertaken as part of the incident process and identified on the incident form e.g. who reviewed the risk, when it was reviewed and what the outcomes were
33	**Random inquiry of staff as to their knowledge of the risk process.**	Understanding and acceptance of the Asset Risk Assessment in the regions can be improved.	Advise the regions on the benefits of the Asset Risk Assessment and how they can help the organisation achieve business objectives.
34		NW Region is not currently using the Asset Risk Assessment.	Align NW Regions approach to the use of the Asset Risk Assessment
35	**Review the application of risk by personnel.**	Application of the Asset Risk Assessment in the regions can be greatly improved.	Improve the application of the Asset Risk Assessment in the regions.
36	**Test availability and knowledge of risk framework documentation**	It is recognised that improvements to the Asset Risk Assessment are required for it to be successfully applied in the Corporation.	Embed the Asset Risk Assessment within the organisation by making it more user friendly and improving education.
37	**Test that water quality risks have been identified and controls are in place to mitigate risks e.g. blue green algae or equipment failure**	Corporate risks are not currently managed centrally in one risk information system.	On procuring the new Risk information system (register) incorporate Water Quality risks into the system
38	**Review the identification of failure modes by asset type**	Current failure mode data especially in NW Region is of poor quality. Every “repair” work order requires mandatory fault cause and fault position in context with the repair work being undertaken to be captured and feedback. There has been extensive training and instruction issued on this requirement.	Establish codes for failure mode input into work orders and make it mandatory to be completed.

Rec. No.	Asset Management Process	Issue	Recommendation
39	**Examine whether the consequences of asset failure are regularly assessed**	Currently the identification of consequences of asset failure is adhoc.	Implement a consistent approach to the identification of consequences of asset failure across WaterCorp.
40	**Sample a number of asset failures. Determine if root-cause analysis has been completed and what has been done as a result of the analysis.**	There is no apparent link between incidents and analysis resulting from the incident.	Re-visit the recommendation from the AMSER 2009 audit and review incident reports to ensure cause of incident, links/references to the root cause analysis document and the date completed are recorded.
41		Data can be entered into the incident management systems resulting in inconsistent data.	Develop consistency of approach to data entry by incorporating standard codes for incidents so that reporting can be structured.
42		Gaps have been identified in the response to incidents based on the degree of impact of the incident e.g. need for root cause analysis	Enhance the E2E process for incident management that addresses incidents that create different levels of impact.
43		Gaps have been identified in the response to incidents based on the degree of impact of the incident e.g. need for root cause analysis	Develop triggers within the incident management system in line with a decision tree to identify and monitor future actions to address the incident raised.
44		There are gaps in the data being reported for incidents.	Review the data quality within the incident management system to address the supporting processes, data and the effectiveness of the system.
45		There is no documented evidence of the issues and responses associated with the Jabbarup main failure e.g. root cause analysis, investigations etc.	WaterCorp needs to complete the investigation on the Jabbarup main failure and identify future actions as required.
46		Critical assets are not known within the North West region and therefore failures are occurring in areas that could have been avoided if the consequences were known and appropriate controls put in place.	A formal criticality assessment be applied across the corporation.to improve the prioritisation of assets and associated works.

Rec. No.	Asset Management Process	Issue	Recommendation
47		With respect to the Jabbarup Crescent failure in Newman there doesn't appear to have been any internal review conducted. The Region does not appear to have contacted anyone centrally to support and/or assist them with this issue or to follow it through to a long term.	Develop and implement a strategy to ensure multiple or repeat faults or fixes for the same address or asset are highlighted and investigated.
	Contingency Planning		
48	**Identify contingency plans and their review processes.**	Generic contingency plan templates have been developed for Water Treatment Plant, Water Pumping Stations, Sewerage Treatment Plant, Sewerage Pumping Stations, Chemical Dosing Plant, Sewer Gravity Mains, Sewerage Pumping Mains, Water Mains, and Water Storage Complex's. Contingency plans are either based on safety e.g. Cl_2 gas or event based e.g. cyclone, bushfires. More recently operational contingency plans have been produced in the North West Region and are in draft format. These plans have been produced for Onslow, East Pilbara and Hedland. There is confusion however across WaterCorp personnel with respect to the purpose, use and definition of contingency plans. This confusion should be addressed when personnel have access to the draft contingency planning guidelines.	Finalise the draft contingency planning guidelines.
49	**Do a walkthrough of contingency plans (Desktop and exercises) and check for compliance. Explore the frequency of updates.**	A formal and prioritised approach to contingency planning is required.	In addition to the current update frequencies prioritise the update of contingency plans based on risk should be considered e.g. Use the ARA process to identify high risk assets and then update the associated contingency plan. The relationship between ARA and Contingency plans is currently being scoped.

Rec. No.	Asset Management Process	Issue	Recommendation
50	**Review the availability of incident and emergency management plans for each site**	The NW Region has put in extensive efforts to producing a contingency spreadsheet that currently sits in isolation from the rest of the Organisation.	The concept behind the NW region spreadsheet should be integrated with the corporate system such that it becomes accessible to all personnel responsible for repairing operational failures.
51		There is an apparent confusion within WaterCorp to the meaning and application of incident management, emergency management and contingency planning. The need for improved understanding of WaterCorp's contingency planning processes is understood and supported. Work is progressing and the requirement for additional support/focus across the asset management and service delivery should be explored.	The naming convention for Contingency planning needs to be clarified and defined to WaterCorp personnel with the view to eliminating confusion between the terms incident management, emergency management and contingency planning. Work is progressing to improve the understanding of the contingency planning process and the requirement for additional support/focus across asset management and service delivery should be explored.
	Financial Planning		No Recommendations
	Capital Expenditure Planning		No Recommendations
	Review of the Asset Management System		
52	**Consider the need to update the asset management plan based on the results of the asset management system review.**	The Strategic Asset Management Plan (SAMP) contains recommendations for improvement for each group within the AM Branch. Recent reviews such as this review and the WSAA benchmarking project have identified additional improvements.	As a result of this review and the WSAA benchmarking, the SAMP should be updated to include the recommendations compiled in this review that are relevant for each group in the AM Branch. This consolidation would allow the internal and external recommendations to be captured in the one improvement register.

Summary Opinion

In accordance with section 11.1 of the Audit Guidelines the following is our summary opinion of the control environment operated by the licensee.

Management Philosophy and Operating Style

WaterCorp's management philosophy supports the following:

- Service levels to be met should reflect the community's willingness to pay;
- Achievement of required service levels at least whole of life cost considering operating & maintenance, asset renewal and asset upgrade costs;
- Adoption of a risk based approach to asset management assessing both the consequence of asset failure and the probability or likelihood of failure when determining preventative maintenance and condition assessment programs to ensure the best use of available resources; and
- Asset decisions must consider social, environmental and economic aspects to ensure long-term sustainability – a 'forever' business.

With regards to the operating style WaterCorp:

- Takes a process accountability approach to asset management with key processes documented and nominated process managers responsible for ensuring their processes are followed;
- Tries to achieve consistency as a base approach accepting that at times some regional flexibility may be required given the range of environmental conditions across such a vast geographical area covered by Water Corporation; and
- has structured to achieve a focus on development of asset strategies/policies/support tools in head office and a focus on delivery of strategies etc in the country operating regions and metropolitan alliances

In addition to the above, WaterCorp actively promotes continuous improvement of its people and within the business. Management is also eager to provide opportunities to personnel for growth and experience. The focus of management is the delivery of services in a safe and effective environment whilst being able to demonstrate sound governance and decision making.

Management actively promotes the development of a culture that encourages staff development, whist still delivering effective services to the community. Support is provided to personnel through many avenues including workshops, internal and external training, documentation accessible through the intranet, systems aligned to business needs and ongoing communications between Divisions.

The regions are actively supported from Corporate including the provision of support from the Asset Management Branch through the provision of resources to undertake or support activities in the field e.g. asset condition assessments and training in asset management activities.

It is our opinion that the approach undertaken by WaterCorp reflects current industry objectives and provides the basis for delivery of services through effective asset management.

Organisational Structure

The organisational structure of WaterCorp is a functionally based structure focused on the key delivery outcomes of the licensee. The Divisions include:

- Regional Customer Services;
- Metropolitan Customer Services;

- Planning and Capability incorporating Asset Management;
- Acquisition;
- Business Services;
- Finance; and
- Communications.

The Asset Management Branch includes:

- Strategy and Integration responsible for the development of asset strategies and direction;
- Capability responsible for analysing asset capability of determine treatment solutions;
- Renewals planning responsible for the planning and investigation of asset renewals;
- Information systems and data responsible for the implementation and use of systems and the quality of data; and
- Maintenance responsible for the planning and analysing of asset maintenance.

The Regions are located in the Regional Customer Services Group as the direct interface with the customer's undertaking operations and maintenance, management of projects within the region and the delivery of services.

The organisational structure is subject to review based on improving the internal relationships and delivery of services. Recent changes resulted in the formation of the Renewals Planning section and the integration of Asset Capability group into the Asset Management Branch.

Based on our experience it is our view that the current organisational structure provides the opportunity to provide improved planning and tighter management of the assets.

Assignment of Authority and Responsibilities

WaterCorp has for many years used the accountabilities framework as the primary document for articulating its accountabilities to its personnel. The framework provides a hierarchy linking WaterCorp's purpose, customers, services and core processes. For each process it identifies supporting sub-processes together with the Manager's accountable for delivering the sub-processes.

In addition to the above the accountabilities for employees, line managers, regional business managers, process owners, process managers and the Chief Operating Officer are also defined.

This framework is accessible by all personnel through the intranet. Based on observations it was clear that personnel had the framework on their desks and used it as one of their primary sources of information.

It is our view that the accountabilities framework has been produced and implemented to a best practice level.

Use of Internal Audit

The Management Risk and Assurance (MR&A) Branch undertake yearly audits within a three year program that includes a review of asset management processes. The primary objective of the MR&A is to provide independent, objective assurance activities designed to add value to continuously improve the Corporation's operations. The MR&A has responsibilities to the Board of Directors, the Audit & Compliance Committee and the Chief Executive Officer. The MR&A operates in accordance with the Institute of Internal Auditors Professional Practices Framework and involves but not limited to:

- Appraising compliance with laws, legislation, policy and procedures;

- Assessing the relevance, reliability, timeliness and adequacy of management information;
- Recommending improvements in procedures and systems; and
- Performing adhoc appraisals, inspections, investigations, examinations or reviews.

The outcomes of the internal audits are recommendations for improvements that are then monitored. Internal reviews have been undertaken within the review period to identify improvements to asset management. Since the 2009 asset management effectiveness review, internal audits have included:

Asset management related reviews undertaken by MR&A	Status
2009/2010 Program	
Asset Built Fit for Purpose Assessment	Completed
Critical Infrastructure (Operational)	Completed
Asset Data Integrity	Completed
Asset Maintenance Management	Completed
2010/2011 Program	
Engineering Asset Design Maintenance	Completed
2011/2012 Program	
Delivery of Planned Maintenance	Report to be re-issued for management comment
Adherence to Planning and Design Standards	Report issued for management comment

In addition to the above, audits are undertaken within Branches to monitor and identify new improvements to existing processes, systems and data. Internal audits are also undertaken within the regions and include audits of business processes.

Project management and contract management processes are certified to AS/NZS ISO 9001:2008 and this has been continuing since 2005. A re-certification is undertaken every 3 years and a review every 6 months.

An action team has been established to discuss and review processes. The internal audit schedule includes:

- Project Management;
- Procurement and administration; and
- Processes required by the adopted standards.

It is our view that WaterCorp's internal audit process is extensive with the objective of ensuring all work is undertaken in accordance with business needs.

Use of Information Technology

WaterCorp has expended extensive resources both in monetary terms and effort to procure, develop and implement systems that will support the business. Examples of these systems include:

- SAP Financial and asset register;

- Project Management Reporting System;
- System Capability Matrix;
- Asset Risk Assessment System;
- System Risk Assessment;
- System Capability Framework;
- SCADA; and
- GIS.

In addition to the above mobile devices are used in the field to assist in the work order process. WaterCorp is also furthering the use of technology by identifying systems that will support renewal analysis and forecasting and asset performance for identifying the appropriate timing of upgrades or replacement of assets. In addition to systems work has been undertaken to either improve the interface or integration of systems.

It is our opinion that WaterCorp's use of systems and its development or procurement of systems to support its needs is exemplary.

Skills and Experience of key Staff Members

Throughout the review, personnel were tested on their knowledge of the business processes impacting on their work. In all instances personnel demonstrated a sound knowledge of these processes. Personnel undertaking specific work are all qualified in the area they specialise. Personnel either have trade qualifications or are qualified through tertiary qualifications or similar.

All staff training is managed through the Learning and Development System (LMS) (coordinated by Head Office).

The training and testing of operators varies across WaterCorp's personnel:

- Civil assets (non trade personnel) meet certificate 2 & 3 of national qualifications; and
- Mechanical & Electrical (trade personnel) subject to standard qualifications.

Personnel also undergo yearly safety training.

A training needs analysis is undertaken for each district in the North West region to identify training needs. All operators have performance service agreements in place with the Corporation. As part of this, training requirements are identified in line with prospects. Training is also extended to personnel in head office using the LMS to enhance their knowledge and experience.

The training process contains a skills recognition process for water industry workers, which recognises prior learning of operators to assist in the progression towards a National Qualification or Statement of Attainment as well as off-the-job learning and assessment.

It is our opinion that WaterCorp seeks to employ personnel experienced in their fields of expertise and provides training for personnel to improve their expertise subject to budgetary constraints.

Conclusion

Odysseus-imc Pty Ltd has completed the 2012 Asset Management Effectiveness Review. The review examined the measures taken by WaterCorp (the licensee) for the proper management of the assets used in the provision and operation of services and where appropriate, the construction or alteration of relevant assets.

Odysseus-imc Pty Ltd believes the findings in this document are an accurate reflection of the outcomes of the review.

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Director
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Date Signature Attached: 16th October, 2012

INTRODUCTION

BACKGROUND

Water Corporation (WaterCorp) is required to undertake an asset management system effectiveness review (AMSER) not less than once in every period of 24 months (or such longer period as the Economic Regulation Authority allows) according to the Water Services Licensing Act 1995. Similar reviews have been undertaken in the past namely 2002, 2004, 2006 and 2009.The outcomes of the 2012 review are identified in this report outlining the performance of WaterCorp with respect to asset management key processes as well as recommendations for improvement against each process where identified. It is further understood that the outcomes of the review are reported to the Economic Regulation Authority (ERA).

The time period covered by this review is 2009 – 2012. This report is an impartial review of WaterCorp's asset management effectiveness under the ERA guidelines.

REVIEW OBJECTIVES

The objective of the asset management review was to assess the measures taken by WaterCorp (the licensee) for the proper management of the assets used in the provision and operation of services and where appropriate, the construction or alteration of relevant assets.

REVIEW PROCESS

The review conducted between 2nd July 2012 and 20th September 2012 examined the asset management processes used by the Water Corporation in delivering the services to its customers. On-site reviews were undertaken between 23rd to 26th July and 30th July to 2nd August respectively. The services to the customers include lifecycle processes for:

- Asset planning;
- Asset creation/acquisition;
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- Asset management information system (AMIS);
- Risk management;
- Contingency planning;
- Financial planning;
- Capital expenditure planning; and
- Review of the asset management system.

As well as the processes, the asset management supporting systems were tested as to their use and effectiveness. Data used by WaterCorp was also examined with respect to its effectiveness for asset management and the delivery of outcomes.

Supporting documented procedures were examined to establish availability and use. In addition the understanding of the procedures and their accessibility were tested.

The asset management planning documentation was reviewed as to the content, use and usefulness for planning. The application of the documents and their input into the lifecycle processes above was

tested. Operations and maintenance activities were examined in terms of the implementation and consistency across WaterCorp. Appendix A contains the list of the documents sighted.

The recommendations identified in the previous review were examined and the outcomes included in this report.

Tests were undertaken through interviews and investigation of the processes to assess whether they were being performed as documented.

The licensee's representative who was responsible for managing this project was Sugandree Muruvan – Asset Strategy and Integration Manager.

The Odysseus-imc representatives who undertook this review were Sandy Muir and Tahlia Griffin who have spent approximately 360 hours on this review.

CORPORATE INVOLVEMENT

The review process adopted was used to assess the:

- Existence and effectiveness of processes;
- Existence of process documentation;
- People's understanding of the availability of documented processes;
- Understanding of the processes themselves; and
- Use of the processes for completeness (total or partial use) and consistency.

The WaterCorp personnel nominated as accountable for the provision, review and implementation of the supporting processes were interviewed. The managers involved are identified in the following table.

Key Processes	Accountable Managers
Asset planning	• Infrastructure Planning, • Strategic Asset Management, • Region
Asset creation and acquisition	• Infrastructure Planning, • Capital Investment, • Project Management
Asset disposal	• Tactical Asset Management, • Operational Asset Management
Environmental analysis	• Strategic Asset Management, • Infrastructure Planning, • Corporate Planning, • Regulation & Compliance, • Tactical Asset Management
Asset operations	• Strategic Asset Management, • Tactical Asset Management • Operational Asset Management, • Mechanical & Electrical Services, • Service Delivery, • Water Production, • Wastewater Treatment,

Key Processes	Accountable Managers
	• Region
Asset maintenance	• Strategic Asset Management, • Tactical Asset Management • Operational Asset Management, • Mechanical & Electrical Services, • Region
Asset management information system (AMIS)	• Strategic Asset Management, • Tactical Asset Management, • Information Services, • Various system users
Risk management	• Tactical Asset Management, • Risk Management, • Regulation & Compliance
Contingency planning	• Tactical Asset Management • Operational Asset Management, • Region
Financial planning	• Corporate Planning, • Financial Management, • Strategic Asset Management
Capital expenditure planning	• Capital Investment, • Corporate Planning, • Strategic Asset Management
Review of the asset management system	• Strategic Asset Management

TABLE 2 - MANAGERS INVOLVED IN KEY PROCESSES

Appendix B contains the list of interviewees.

Supporting asset management documentation was sighted. In addition the flow of the process was tested from an application perspective.

Key processes were reviewed as identified in the ERA guidelines and were assessed in Head Office, Aroona Alliance and North West Region. It is understood however that specific processes such as high level strategy and communications between WaterCorp and the ERA are undertaken corporately while the regions implement processes that impact locally e.g. local planning, capital works and operations and maintenance as well as responding to corporate requirements. This was accounted for during the review.

REGION INVOLVEMENT

This review included a visit to the North West Region and Aroona Alliance with the view to identifying the degree to which the asset management system is used; in particular how well processes developed centrally are implemented within the regions. In addition interviews were undertaken with select WaterCorp personnel that either implement the central processes or are responsible for development and implementation of regional asset management processes. In reviewing the processes the asset management relationship between the regions and Head Office was explored with respect to the communications and implementation.

The regions are heavily involved in asset management processes such as operations, maintenance and capital works planning and delivery. As such personnel within the region were interviewed against these processes. Sample testing was undertaken to test the application of processes and availability of supporting documentation. In addition the use of documentation such as asset management plans and maintenance plans were reviewed for application.

Site visits were undertaken at Woodman Point WWTP, Port Hedland, Karratha and Newman with the view to understanding the condition of the assets, the issues at each site and the drivers impacting on operations and maintenance.

WATER CORPORATION POST 2009 REVIEW ACTIVITY

The 2009 Asset Management Effectiveness Review identified 22 actions to be addressed. The actions were scheduled for completion between 2009 and 2012. The following statistics and comments relate to the progress identified up to July 2012 which was documented in the AMSER 2009 Post Review Implementation Plan.

Of the 22 actions:

- 14 actions have been completed;
- 1 action is on track for completion;
- 2 actions have been extended in time;
- 4 actions are in progress; and
- 1 action has not been completed.

The following table documents the status of the 2009 improvements actions aggregated by key process. Details of the actions and their status can be found in Appendix C.

Key Processes	Actions Identified	Actions Not Completed	Actions in Progress	Actions Completed	Actions On Track	Actions Extended
Asset planning	**4**			2		2
Asset creation and acquisition	**1**			1		
Asset disposal	**0**					
Environmental analysis	**0**					
Asset operations	**3**		1	2		
Asset maintenance	**6**		1	4	1	
Asset management information system (AMIS)	**3**			3		
Risk management	**2**	1	1			
Contingency planning	**0**					
Financial planning	**1**			1		
Capital expenditure planning	**2**		1	1		
Review of the asset management system	**0**					
Total	**22**	**1**	**4**	**14**	**1**	**2**

TABLE 3 – STATUS OF 2009 IMPROVEMENT ACTIONS

PERFORMANCE SUMMARY

As a result of the 2012 Effectiveness Review the effectiveness rating for WaterCorp has been updated to reflect the current findings. It is felt that the ratings in the following table are appropriate for Water Corporation.

Asset Management System	Asset Management Process and Policy Definition Adequacy Rating	Asset Management Performance Rating
Asset Planning	B	2
Asset Creation/Acquisition	A	1
Asset Disposal	A	3
Environmental Analysis	A	1
Asset Operations	A	2
Asset Maintenance	B	2
Asset Management Information System	A	1
Risk Management	B	3
Contingency Planning	B	2
Financial Planning	A	1
Capital Expenditure Planning	A	1
Review of the AMS	A	1

TABLE 4 – ASSET MANAGEMENT EFFECTIVENESS RATINGS

The above ratings are based on the definitions in Table 5 and 6 of the ERA Audit Guidelines: Electricity, Gas and Water Licences – August 2010.

ASSET MANAGEMENT AT WATER CORPORATION

This section of the report provides an indication of the capability of WaterCorp in asset management by highlighting key areas of strength as well as activities that require additional effort.

ASSET MANAGEMENT STRUCTURE

WaterCorp is well structured to apply asset management across the business. The structure adopted in 2005 increased the corporation's capacity to apply the asset management key processes as identified within this review. However, organisational changes have been applied in recent times to further improve its capability namely:

The new Asset Management Branch (AMB) is structured around five key teams, which will be flexible to make sure resources go to high priority areas.

Teams are based around:

- Strategy and Integration (includes a project team)
    - Functions include liaison with other strategic areas within the business, management of KPIs, input into regulatory matters and review processes;
- Information, Systems and Data
    - Functions include ensuring all data is captured, managed and available from a single source; and
- Asset Maintenance, Asset Renewals, Asset Capacity.

Roles in these last three teams above will reflect many of the current activities and some changes in focus across these streams:

- The AMB is a merger of Strategic Asset Management Branch (SAMB) and Tactical Asset Management Branch (TAMB)
- The AMB has five sections e.g.:
    - Renewal Planning Section;
    - Strategy and Integration Section;
    - Capability Assessment Section;
    - Information Systems and Data Section; and
    - Maintenance Section.
- The Water Technologies Division no longer exists. WaterCorp now has Alliances for metro areas responsible for water and wastewater; and
- Operational Asset Management (OAM) branch has moved to the Regional Customer Services Group.

The AMB provides the strategic direction on behalf of the Group to the Corporation e.g. production of the Strategic Asset Management Plan, renewals planning, developing asset management capability, systems, data and maintenance standards. Significant effort is made to ensure the work undertaken within the Asset Management Branch is aligned to corporate and regulatory requirements.

The strategic direction is communicated via the SAMP for the production of the maintenance standards. This also includes the production and implementation of the risk based capital framework and supporting processes e.g. condition assessments used in the identification of asset condition.

The Regional Customer Services Group is charged with providing operational asset management support to the Regions, Water Technology Division, Wastewater Alliances and Asset Delivery. This is undertaken by having the operational managers representing the Corporation in the Regions.

The AMB supports the regions by improving asset management capability, managing the risk based capital process, and providing guidance to the regions in the operations and maintenance of the infrastructure.

FINDINGS

In undertaking the review within Head Office, Aroona and the North West Region, it was clear that key issues requiring improvement are:

- Inconsistency of approach across the corporation; and
- Quality of data needed to assist in asset planning.

The Alliances have recently been established and are in transition. However, it is clear that they have access to WaterCorp systems and extensive work is being undertaken to address the migration of the alliances into the approach to asset management used by WaterCorp. Based on the review it is apparent that the Aroona Alliance has implemented the processes used within WaterCorp. As part of the transition the Aroona alliance is using its own maintenance system for the recording of work orders with the information uploaded into SAP PM on a nightly basis. The systems migration over to SAP is scheduled for early 2013. The exception is the personnel at Woodman Point WWTP who are currently attending to the work orders through the use of mobile devices and work orders generated by the operations centre.

The North West region has recently lost their asset manager to the mining industry. The Regional Manager has recently moved back to the Head Office. The region is also subject to extensive demands to support the growth in infrastructure in Port Hedland and Karratha for the mining companies. This is creating considerable pressures to focus on capital delivery rather than day to day activity.

While using the majority of the corporate systems the ARA required for project planning and renewals planning is not being used. In addition the setting of priorities for project planning is informal and based on the judgment of the region.

In reviewing the content of the work orders and incident management system, data was either not input or information provided unclear e.g. burst watermain could be input in many different ways making basic analysis difficult to undertake with any level of certainty.

The link between incidents and normal asset management process is inconsistent across Regions. Support for stronger involvement from asset management in understanding incident causes, incident management and resolution and future avoidance (e.g. improved asset design. maintenance, operations and business continuity planning).

A visit to Newman was requested by the ERA. The infrastructure was constructed by Newman Iron and is approximately 40 years old. The infrastructure does not meet WaterCorp standards and is reaching the end of its life. WaterCorp is responsible for the water reticulation, sewer reticulation, three sewer pump stations and rising mains up to the outfall sewer. SCADA has been implemented on two of the three pump stations. The remaining pump station has alarm dial out.

The watermains range in material from Asbestos Cement, PVC and Ductile Iron. Valves are non-standard being either clockwise closing or anti-clockwise closing with critical valves not functioning.

Fire hydrants are above ground American style hydrants and are subject to failure (galvanized steel is rusting at the base). There are 100 -150 of these hydrants remaining. In one area of the town the white PVC water mains that do not comply with Australian Standards and are from the original installed infrastructure are failing. Differences in the outer diameter of the older PVC and the aligned older tapping bands are resulting in failures of the replacement tapping bands. This is subsequently causing additional leakages and bursts which have an outcome of repeat outages that affect customers.

The sewer reticulation varies in depth up to 6 metres deep. Inspection of the manholes indicated that of the 75% of the manholes inspected 40% need replacement. The inspections also high-lighted bulging and failure of the manhole covers presumably caused by gas build up in the reticulation. Manholes are decaying from sulphide attack with signs of decay in the pump wells.

Newman is supported by one civil based WaterCorp representative supported by a plumbing contractor from Newman and supervised by the operations supervisor from Port Hedland. Mechanical and electrical maintenance is provided by Hedland based trades people. It is however intended that an additional WaterCorp representative provide support out of Newman. While work is undertaken in Newman, the work is provided to Port Hedland in hard copy format before it is entered into the system.

Recently watermain failures have occurred in Jabbarup Crescent and Roger's Way in Newman have high-lighted potential risks and liabilities for WaterCorp. The age of the infrastructure is also a concern that may result in significant capital expenditure in the future.

As part of the Maintenance Strategy in Newman, the Corporation conducts preventative jet washing of sewers where there are known blockage hotspots based on past blockage history. It should be noted that for this specific area, there is no intensive preventative maintenance plan in place as there hasn't been a high number of blockages recorded. In addition the following preventative actions are undertaken to minimise blockages in Newman:

- The Civil Technical Consultant uses a CCTV camera to view the internal of the sewers. He advises that his camera investigations have shown that there is some root intrusion mostly where there is earthenware pipe. Most of the roots observed in the pipes are not large, but fibres.

- The Corporation employs Industrial Waste Inspectors who are engaged to check industrial and commercial premises who have industrial waste permits to ensure that grease traps are being used and maintained correctly to prevent substances entering the sewer system which may cause blockages and inconvenience to customers.

To address the issues related to the Newman assets above it is intended that the Asset Management Branch monitor repeat failures centrally and notify the regions of the repeat failure so that the regions identify the actions required to rectify the issues.

STRENGTHS

Key strengths of WaterCorp include:

- Accountabilities framework and understanding of personnel;
- Ongoing commitment to continuous improvement e.g. improvement plan for the renewal planning group;
- Recognition of the corporation's internal weaknesses;
- Status of asset management system elements e.g.
    - Asset Creation/Acquisition,

    - Environmental Analysis;
    - Asset Management Information Systems,
    - Financial Planning,
    - Capital Expenditure Planning; and
    - Review of the asset management system itself;
- Systems regarded as best practice e.g. SAP[1], PMRS[2], SCM[3], ARA[4], SRA[5], SCF[6];
- Use of mobile devices;
- Availability of policy and process documentation and information across the business;
- End to end planning process;
- Activity based planning undertaken in Aroona Alliance;
- Significant increase in governance control via policy standard and guidelines for ex-TAM[7] asset management processes since the last audit;
- Use of the intranet for providing access to Corporate information, systems and documentation;
- Commitment to training of personnel across the State;
- Business Performance Reporting System; and
- Understanding of personnel of processes for which they are involved.

Weaknesses

Key weaknesses of WaterCorp include:

- Inconsistent approach to the application of asset management across the corporation at the operations and maintenance level;
- Quality of asset data required to support asset planning;
- Implementation of corporate processes in the region;
- Documents do not have revision dates or have not been updated in accordance with revision dates;
- Lack of use of the ARA framework;
- Link between Incident Mgmt and ARA;
- Quality of feedback within the maintenance work orders;
- Current gaps in the process for identifying assets to be disposed;
- Confusion in the terminology used in the Risk management process; and
- Apparent gaps in the analysis of asset failures.

Potential Improvements

Notwithstanding the findings of the WSAA asset management benchmarking process and internal reviews following the 2009 asset management system effectiveness review the following activities are subject to further improvement:

- Completion of Strategic Statements;
- Improvement to supporting data e.g. additional characteristics, data cleansing, education;

[1] SAP - Water Corporation's main financial/asset management system

[2] PMRS – Project Management Reporting System

[3] SCM - System Capability Matrix

[4] ARA - Asset Risk Assessment system

[5] SRA – System Risk Assessment

[6] SCF – System Capability Forecasting

[7] TAM – Tactical Asset Management Branch

- Documentation to support renewal planning;
- Implementation of Optioneering;
- Procurement and/or development of tools to support forecasting of renewal expenditure;
- Completion of the System Capability Matrix and Framework;
- Improvement to incident management process;
- Completion of SCADA implementation; and
- Consistent use of Corporate processes across regions.

OBSERVATIONS AND RECOMMENDATIONS

This section outlines the observations resulting from the tests applied during the review. The recommendations result from the observations and are focused on providing clear direction to WaterCorp over the next three years.

1. ASSET PLANNING

Key Process	Outcomes	Effectiveness Criteria
Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).	Integration of asset strategies into operational or business plans will establish a framework for existing and new assets to be effectively utilised and their service potential optimised	• Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning • Service levels are defined • Non-asset options (e.g. demand management) are considered • Lifecycle costs of owning and operating assets are assessed • Funding options are evaluated • Costs are justified and cost drivers identified • Likelihood and consequences of asset failure are predicted • Plans are regularly reviewed and updated

Test No.	Testing	Observations	Recommendations
1	**Identification and inspection of planning process documentation**	The planning process consists of two planning streams that form part of the overall asset acquisition process: • Infrastructure planning phase; and • Renewal planning phase. The infrastructure planning phase is represented by a process flow chart that depicts the steps involved;	Renewal Planning Group to develop supporting documentation such as: • Business case; and • Process manual. Asset management planning

Test No.	Testing	Observations	Recommendations
		'Infrastructure Planning Phase'. An up to date 'Planning Process Manual' is available which describes Water Corporation's infrastructure planning process including the responsibilities of Water Corporation stakeholders. It is supported by many documents within the total planning process including: • Statewide Planning Program (SWPP); • Strategic Asset Management Plan; • Capital Investment Program; • Asset Acquisition Guidelines; • Asset Commissioning Guidelines; and • Asset Disposal Guidelines. • The output of this planning phase is the development of the Strategic Investment Business Case's (SIBC's) to meet growth and change strategies. The planning phase also considers System Capability through System Capability Assessments (SCA's); • System Risk through System Risk Assessments (SRA's); and • Strategic planning needs from business through Planning Business Case's (PBC's). The renewal planning section within WaterCorp has recently been part of a branch wide re-structure which has seen its formation which sits within the Asset Management branch. Previously, this work was	procedures objectives, purpose and content to be reviewed. All procedures to be updated in line with agreed approach. Procedure document needs to reflect current approach including asset renewal, strategic statements etc. Implement the 'Our Plan, Monitor and Assess Asset Performance, Condition & Risk Story' by setting clear target dates and responsibilities in order to achieve the desired result.

Test No.	Testing	Observations	Recommendations
		undertaken by the Tactical Asset Management (TAM) Branch. This Branch was also responsible for the planning for maintenance, upgrades and new assets. This was the responsibility of the Asset Capability section within TAM. Having been formed for only 2 months the renewal planning group is finding its feet and working towards producing supporting documentation such as: *Business Plan* – planned for completion in the next 2 to 3 months it is expected to consist of: • Section Objectives; • Future Focus; • Future Priorities; • Key Performance Indicators; • Action items. *Renewal planning manual* will be consolidated on the renewal planning intranet page and will consist of: • High level process flow chart; • Detailed process steps and information flow: • Required inputs and outputs; • Roles of the central group and regional groups. The renewal planning phase is currently represented by a process flow chart that depicts the steps involved; 'Renewal Planning Phase.pdf'. With the current changes	

Test No.	Testing	Observations	Recommendations
		this document is likely to need modification over the next 6 months. The output of this planning phase is the development of the Strategic Investment Business Case's (SIBC's) to meet asset renewal strategies. The renewal planning group is responsible for producing 4 SIBC's: • Water Mains; • Sewer Mains; • Water Production and Storage; and • Wastewater Treatment and Pumping. These 4 documents are regularly available. Those sighted were: • Water Production and Storage Renewals SIBC; and • WW Treatment and Pumping Renewals SIBC. 'PCY343 Asset Assessment' sets the asset assessment policy for the Corporation so that it can proactively determine the state of its assets to ensure risk and asset capability are managed to deliver reliably services. Guideline for Plan, Monitor and Asses Asset Performance, Condition and Risk Process: This guideline document covers the processes for monitoring and assessment of:	

Test No.	Testing	Observations	Recommendations
		• Asset condition and performance; • Asset failure histories and trends; • Actual versus planned and specified requirements (e.g. Levels of Service and Key Performance Indicators); and • Asset risk. 'Our Plan, Monitor and Assess Asset Performance, Condition & Risk Story': This one page document considers: • The current status; • Strategies required to improve; and • Desired state of what the Corporation is striving for. Planning Procedures: • Procedure for Asset Management – Planning - Perth Region, 2004 version due for update in 2010; • Procedure for Asset Management – Planning - North West Region, 2002 version due for update but the revision date is not specified; and • Procedure for Asset Management – Planning - South West Region, 2011 version due for update in 2013. The south west region procedure presents the new	

Test No.	Testing	Observations	Recommendations
		template of the asset management planning procedure which is a cut down version of the earlier procedures. It appears to lack explanation and representation of the current asset renewal process. The three procedures inspected above are inconsistent in their nature. The objective of these procedures including the content to appropriately support asset management processes and concepts should be reviewed. 'PCY344 Managing Asset Capability' sets the policy for planning and managing of asset capability so that the assets meet future performance requirements. The 'Assess Asset Capability Guideline' describes the process for analysing all relevant asset performance, condition and risk information including the assessment of options and initiation of actions in time to ensure assets can meet future performance requirements. Changes have been made to this document representing the changes to the Asset Management Branch. The 'System Capability Matrix (SCM) – User Manual' provides the user guidance needed to understand its purpose and to use it in practice. System Risk Assessment (SRA) is the main application accessed from the System Capability Matrix (SCM). 'System Capability Forecasting (SCF) – User Manual' is currently under development and provides guidance on	

Test No.	Testing	Observations	Recommendations
		using the capability forecasting tool. Capability forecasting in the North West Region is currently undertaken in spreadsheet format and is planned to be implemented into the forecasting tool.	
2	**Assessments of sample projects and walk through processes. Is there a manual? Review availability and awareness in relation to manual.**	An assessment of the following projects was undertaken: • Denham Dual Supply Potable/Non-potable Water; and • Broome Water Supply Scheme 2010 (North West Region). The assessment found that each project followed the guidelines and procedures outlined in the planning process manual. This document is available on WaterCorp's document management system, "AquaDoc". People interviewed were aware of the manual and its contents. Renewals planning section intends to develop a manual or equivalent within the next 6 months.	No Recommendations
3	**Random inquiry of staff as to the knowledge of staff of the processes.**	During the review, planning personnel in water and wastewater and the Aroona Alliance were questioned about the planning processes. This was achieved in two ways:	No Recommendations

Test No.	Testing	Observations	Recommendations
		• Assessing existing planning projects through each stage of the planning phase; and • Testing staff knowledge of the planning process and how it fits into the overall end to end acquisition process. It was concluded that personnel were very knowledgeable about the processes they undertake and the relationships between those processes and other corporate processes either following or preceding planning.	
4	**Assess the adequacy of the asset management plans w/r to the planning process. Are the capital works and maintenance budgets aligned to the asset management plans?**	Since 2009, the asset management branch has produced 17 out of the 21 asset class plans nominated for development. These are: • Borefields, September 2011; • Cathodic Protection Systems, January 2012; • Disinfection Systems, April 2012; • Electric Motor, February 2012; • Main Sewers, August 2012; • Power Distribution, June 2011; • Instrumentation, January 2012; • Pump Equipment, May 2011; • Retic Sewers, August 2010; • SCADA, March 2011; • Switchboards, June 2010; • Trunk and Distribution Mains, August 2010; • Water Meters, June 2010;	Complete the remaining 17 strategy statements. Improve the renewals forecasting of sewer mains (large and small) by obtaining an appropriate tool to undertake the analysis. Improve forecasting of whole of life cost for mechanical and electrical assets by obtaining an appropriate tool. There needs to be a joint effort by the central group and regions to improve quality and

Test No.	Testing	Observations	Recommendations
		• Water Retic Mains, August 2010; • Water Storage, September 2010; • Farmlands Mains, August 2010; and • Wastewater Pressure Mains, June 2011. Over the last 3 years Asset Class Plans (ACPs) have been adopted as a more focused way of addressing asset management. While more traditional asset management plans have had a strong capital focus the ACPs clearly look at maintenance and condition assessment strategies as well as renewal strategies for existing assets. The ACPs focus on management of existing assets. New assets required for growth or changes in standards are dealt with through other processes such as System Risk and System Capability Forecasting tools, and system planning work. Collectively the ACPs and the growth/standards tools can be used to form broader asset management plans. A recent decision by the Asset Management Branch has been made to conclude any further development of asset class plans and develop 'strategy statements' instead. It is expected that 18 strategy statements will be produced in total of which 10 will be produced in the 2012/13 financial year and the further 8 in 2013/14. At the time of this review one of the eighteen strategy statements has been completed. The first strategy statement selected was for sewer	accuracy of data. The data collection KPI's process needs to be re-initiated to ensure the collection of the data is undertaken in a timely manner.

Test No.	Testing	Observations	Recommendations
		gravity mains, this document is in DRAFT. The change in focus comes with the intention to provide the same information but in a more interactive manner. The purpose of the strategy statements are to: • Portray the philosophy for the asset group; • Bring together all aspects of an asset management plan in one place through links to the information; • Be used for induction purposes with the introduction of new staff; and • Be used to educate personnel within the Corporation e.g. General Managers. The 18 strategy statements will be: 2012/13 - • Gravity Sewers (DRAFT); • Meters; • Water Storage; • Disinfection Systems; • Bore Sites; • SCADA; • Pump Equipment and Motors; • Trunk and Distribution Mains; • Water Reticulation; and • Wastewater Pressure Mains. 2013/14 –	

Test No.	Testing	Observations	Recommendations
		• Instrumentation; • Switchboards; • Control Valves; • Power Distribution; • Civil Structures; • Drainage; • Buildings and Grounds; and • Cathodic Protection. The order of creating the Strategy Statements has been prioritised based on needs of the business and high profile assets. It is intended that the current asset class plans will still be utilised in conjunction with the strategy statements but no further asset class plans will be developed. The renewal planning group relies heavily on quality and accurate data inputs for the development of the renewal strategies and for prioritising renewal projects. These data inputs include: • Asset Risk Assessments (ARA); • Asset Condition Assessments (ACA); • Work order failure data; and • Asset Deficiency Report (ADR) records. The renewals group is using similar but independent data from the asset class plans as they are at a different maturity level than the asset class plans. As data is	

Test No.	Testing	Observations	Recommendations
		constantly evolving current information is required from present condition programs and any other up to date information such as failure records to feed renewal planning on an annual basis. The asset class plans give a good indication (where data is available) of the past issues, state of the assets including failure rates, operational and capital spend and the recommendations moving forward considering all constraints. While Water Corporation already has a range of asset management tools in place the concept of the ACPs (and now strategy statements) is to review each of the key asset management elements across the key asset categories (e.g. water mains, sewer mains, pumps etc) to try to optimise how they are managed. They are fundamentally a way of ensuring efficiency and effectiveness for each asset class. On inspection of the asset class plans, statements within the plans identify significant gaps in data supporting the future strategies. The renewal planning group's main focus is to deliver on the improvement of data quality for renewal planning. A current data integrity project is being steered by the Information Systems Branch from an I.T. perspective and undertaken by Deloittes with the view to developing a strategy that sets the scene for improving	

Test No.	Testing	Observations	Recommendations
		data quality across the business. It is intended that the implementation of this strategy will improve the awareness and understanding of other Branches for the need and use of good quality data. The strategy is planned for completion in October 2012 and the implementation of the strategy improvements will take effect soon after. The renewal planning group sees this as a great opportunity to leverage from the strategy to improve visibility of the current data issues they are experiencing and act as a case study representing how poor quality data impacts on outcomes and decisions made. The group is pushing strongly for this to happen. The SIBC process aims to balance different capital spending scenarios against levels of service/operating costs outcomes. In addition to this (where the information is available) the Asset Class Plan considers maintenance, condition assessment and renewals expenditure. Also coupled with this the ACP's consider the risk of not undertaking particular activities against the asset and if appropriate OPEX is budgeted against the risk reduction that will be achieved rather than spending capital dollars. Optioneering is a new concept being implemented by the Corporation and is being built into current processes to ensure non-capital options are exhausted prior to seeking a new capital solution. This is a high priority as identified in the 'Strategic Asset Management Plan	

Test No.	Testing	Observations	Recommendations
		2012'. The assets not covered by asset class plans (e.g. specific treatment plant) have their own maintenance plan that will focus on the maintenance of the plant: • Maintenance Plans are a deliverable by a central "Handover Team" for all Category A & B Projects; • Facility Maintenance Plans have been produced for Smaller WWTPs, Water TPs, Chlorination Sites and SPS's etc.; • Maintenance Plans have been developed for Alkimos WWTP and many components of WWTPs; and • Where a Maintenance standard does not completely cover components of a Project, the Reliability Engineering Team provides strategies for that equipment. Various operations plans for water and wastewater schemes have been produced since 2009. The schedule of production and ongoing review is managed through the 'Scheme Operations Plan Index'.	
5	**Assess if the asset management plan is implemented in practice and assigns clear staff responsibilities.**	The asset class plans have the following structure which will change slightly within the format of the new strategy statements: • Levels of Service;	Enhance the current improvement implementation process by setting clear target dates, assigning responsibilities and monitoring progress

Test No.	Testing	Observations	Recommendations
		• State of the Assets; • Lifecycle management; • Emerging risks; • Financial summary; and • Improvement planning. Improvements identified in the asset class plans have historically been tracked through the 'Change Management Programming' document. Project managers were assigned against each improvement action within the program. It is intended that this process will be improved once the new asset strategy statements are produced.	monthly in line with group meetings.

Documents sighted

- Strategic Asset Management Plan 2012/13
- PM-#870553-v4-Guideline for Plan Monitor and Assess Asset Performance Condition and Risk Process, November 2011
- PM-#1164951-v9C-Assess Asset Capability, June 2009
- PM-#2099953-v1-NWR - Broome Water Supply Scheme - PC255 - Value Management Study Record February 2009
- PM-#3623527-v2D-Infrastructure Planning Process Manual, March 2012
- PM-#3955820-v4A-PCY344 Manage Asset Capability, November 2010
- PM-#3955854-v5-PCY343 Asset Assessment, November 2010
- Infrastructure Planning Branch Management System Map
- Our Assessment of Asset Condition, Performance & Risk - Process Story
- PM-#4216636/2-TAM Process Measures and Data
- PM-#365270-v3-AM - Planning - Procedure for AM - Perth Region, July 2004
- PM-#365273-v1-AM - Planning - Procedure for AM - North West Region, August 2002

- PM-#365409-v3-Asset Management - Planning - South West Region, March 2011
- PM-#4574647-Water Production and Storage AR Strategic Investment Business Case Renewals, June 2011
- PM-#4646336-WW Treatment and Pumping Renewals Strategic Investment Business Case Renewals, May 2011
- Doc ID 4351658, Admin Manual - System Capability Matrix, March 2011
- Doc ID 3571033, System Capability Matrix - SCM - User Manual, September 2011
- Doc ID 5754454, User Manual - System Capability Forecasting, April 2012
- PM-#2974514-v29-ARA Business Rules, July 2010
- PM-#7140764-v1-ARA Session 2
- PM-#7571071-v1-Consequence factors for sewer DST
- PM-#5681583-v5-Change Management Programming
- PM-#6900493-v12-Gravity Sewers Strategy Statement
- PM-#3709104 - Bore Sites, Asset Class Plan, Project Management Plan, September 2011
- PM-#6360290.v1 - Cathodic Protection Systems, Asset Class Plan, January 2012
- PM #3692962.v11 - Disinfection Systems Asset Class Plan, April 2012
- PM-#6247363.v1- Electric Motor Asset Class Plan, February 2012
- PM-#2895106-v3D-Farmland Mains Asset Class Plan, August 2010
- PM-#2892984.V8 - Main Sewers Asset Class Plan, August 2012
- PM-#5568184.V1-Power Distribution Asset Class Plan, June 2011
- PM-#6231423.v1-Project Management Plan of the Instrumentation Asset Class Plan, Project Management Plan, January 2012
- PM-#5568058.v1-Pump Equipment Asset Class Plan, May 2011
- PM-#2892940.v14-Retic Sewers Asset Class Plan, August 2010
- PM-#4619204-SCADA Asset Class Plan, March 2011
- PM-#3810387-Switchboards Asset Class Plan, June 2010
- PM-#894965.v12B-Trunk and Dist Mains Asset Class Plan, August 2010
- PM-#4374634.v8-Wastewater Pressure Mains Asset Class Plan, June 2011
- PM-#3808830-Water Meter Asset Class Plan, June 2010
- PM-#3087652-Water Retic Mains Asset Class Plan, August 2010
- PM-#3633112-Water Storage Project Management Plan, September 2010
- PM-#7424462-v1-AMSER 2009 Implementation Update - Jan 2012

2. Asset Creation and Acquisition

Key Process	Outcomes	Effectiveness Criteria
Asset creation/acquisition means the provision or improvement of an asset where the outlay can be expected to provide benefits beyond the year of outlay.	A more economic, efficient and cost-effective asset acquisition framework which will reduce demand for new assets, lower service costs and improve service delivery.	• Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions • Evaluations include all life-cycle costs • Projects reflect sound engineering and business decisions • Commissioning tests are documented and completed • On-going legal/environmental/safety obligations of the asset owner are assigned and understood

Test No.	Testing	Observations	Recommendations
1.	**Identification and inspection of policies and process documentation.**	The Asset Acquisition Guidelines released in November 2006 updated in 2009 are currently in review. These guidelines identify the processes involved in undertaking asset acquisition and infrastructure delivery. They also describe the interrelationships between Water Corporations core infrastructure processes. The guidelines include discussion on the following: • Asset acquisition framework; • Asset acquisition business requirements; • Capital investment processes; • Program management; and	No Recommendations

Test No.	Testing	Observations	Recommendations
		• Infrastructure delivery. The guidelines are supported by Asset Acquisition Definitions document. The people involved in the latest review include: • Manager, Capital Investment Branch; • Manager, Infrastructure Planning Branch; • Manager, Infrastructure Design Branch; • Manager, Project Management Branch; • Manager, Corporate Planning; • Business Improvement Consultant; • Capital Investment Manager; and • Consultant. The guidelines are supported by policies, standards, manuals, procedures and templates. Typical supporting documents include: • Risk Management Policy; • Asset Management Framework; • Business Case Guidelines; • Business Rules for the Corporate Asset Risk Assessment Process (Asset Risk Assessment); and • Capital Investment Guidelines.	
2.	**Test whether processes cover project evaluation and approval including non-asset options, life cycle cost**	The capital investment process is supported by the asset acquisition guidelines. The guidelines outline the asset	The Optioneering process to be implemented as a feed-in to

Test No.	Testing	Observations	Recommendations
	considerations, engineering and business decisions, and commissioning of assets.	acquisition framework incorporating the capital investment and program management processes. The E2E process framework has been developed and documented. It maps out the full process from options analysis through to commissioning. The 'Assess Asset Capability' process analyses all relevant asset performance, condition and risk information, assesses options and initiates actions in time to ensure assets can meet future performance requirements and deliver service commitments to customers. The optioneering process comes in to play when an issue of capability has been identified as an emerging issue through the Assess Asset Capability. It is in effect the business case development stage where a range of options (including operational, capital, challenging of standards etc) are considered and evaluated to ensure that the most cost effective whole of life solution is being adopted. There is an internal push to incorporate Optioneering process at the start of the process. Optioneering will allow a broader project analysis to be undertaken at the high level e.g. instead of commencing a capital project to solve the problem, identify operational projects that may solve the problem or defer the need for capital. Business cases are the key tools used to assess all capital	the Asset Acquisition Process and that training includes raising awareness in relevant corporate branches and the regions.

Test No.	Testing	Observations	Recommendations
		projects funded by the capital budget. Business cases used include: • Infrastructure planning business case; • Program business case; and • Individual project planning business case. The implementation business case incorporates project evaluation including: • Planning scope; • Key stakeholders; • Planning considerations; • Conceptual options; • Preferred option; • Estimated capital costs; • Operating and maintenance costs; • Duration of works; • Timing of works; and • Risk mitigation. During the conceptual planning phase, non-asset solutions are assessed. Lifecycle cost considerations are assessed over 15 years and incorporate capital, operations and maintenance, revenue and present value costs. Project management processes are extensive and located on the intranet. They are supported by forms, check lists and reports. The processes include:	

Test No.	Testing	Observations	Recommendations
		• Risk assessments; • Project scope; • Planning business case; • Project prioritisation; • Implementation business case; • Project startup; • Project delivery; • Portfolio reporting; • Post implementation reviews; • Asset commissioning; • Asset handover; and • Project closeout. Project Management is undertaken by the Project Management Branch and the Regions. Project delivery includes representation of the operating group, the designers and the project managers, and asset handover at meetings throughout the process. These sessions are used to inform representatives of the progress of projects and to discuss issues. Asset commissioning and handover is a recognised key process in the completion of the project. As such personnel are specifically identified to assist the Project Manager to complete the project. A commissioning management plan is produced for each project. The commissioning management plan (sighted) recognises legal, environmental and safety (OSH), and operational	

Test No.	Testing	Observations	Recommendations
		risks with the equipment.	
3.	**Assess sample jobs and walk through processes. Is there a manual? Review availability and awareness in relation to manual.**	Project management and contract management processes are certified to AS/NZS ISO 9001:2008 and this has been continuing since 2005. The processes are supported by checklists and reports that are assigned to each project. A re-certification is undertaken every 3 years and a review every 6 months. An action team was established to discuss and review processes. The internal audit schedule includes: • Project Management; • Procurement and administration; and • Processes required by the adopted standards. Completed projects are scanned as PDF files and stored in the document management system, AQUA. The following jobs were reviewed as part of the test: 1. Denham Dual Supply – Potable/Non-Potable; and 2. Northam Waste Water Treatment Plant Disinfection. The project files were hardcopy and resided with the Project Manager. The Denham project file included the following:	No Recommendations

Test No.	Testing	Observations	Recommendations
		• Scoping phase – brief, work plan; • Detailed planning including consumption, abstraction data and service numbers; • Review of the source and storage needs; • Options analysis including stakeholder findings; • Planning document from workshops and analysis • Planning business case; and • Capital improvement program. The Northam project was a work in progress passed onto the project manager at project activation. Initially forms were found to be missing with record of the project file being reassembled and relevant forms completed. Upon inspection all forms up to the current status were complete. The project manager was tested for the process and found to be very knowledgeable even citing knowledge of the proposed Optioneering process. The projects are supported by numerous documents (which together form the manual) including: • E2E process document; • Audit checklist; • Asset acquisition guidelines; • Project start up checklist; • Asset handover checklist; • Project closeout report; and	

Test No.	Testing	Observations	Recommendations
		• Asset commissioning guidelines. With respect to Aroona Alliance the following project was reviewed – Woodman Point SBR 2, Membrane Upgrade C-S21908 under the category of minor projects The project folder was reviewed alongside the project manager. The processes undertaken at the Aroona Alliance are the same processes undertaken elsewhere within the corporation. The required forms including asset close out forms, asset transfer certificate and asset commissioning guidelines were observed.	
4.	**Observation of documentary evidence of processes applied to completed projects (Walk through samples of creation since last review).**	Project close out reports are produced as part of project management processes. These reports focus on project delivery and the lessons learnt from the process. The closeout report Is undertaken within 3 months of practical completion and is the responsibility of the Project Manager. The closeout report is supported by the closeout checklist (Sighted) that provides guidance to the Project Manager for completing the remaining procedures. The close out report for Armadale McNeil Road SPS was examined. The report included the following: • Project Scope; • Delivery Strategy; • Time and financial performance;	No Recommendations

Test No.	Testing	Observations	Recommendations
		• Approved scope changes; • Performance against key objectives; • Stakeholder issues; • Highlights and innovations; • Outstanding project completion actions; • Comments by internal stakeholders; and • Lessons learned action items.	
5.	**Review evidence of commissioning tests, documentation and completion of testing.**	Asset commissioning is managed by the commissioning managers who are appointed as part of the project definition phase. This provides the commissioning manager with the opportunity to be involved in the projects from start to completion and as such provides them the capacity to stipulate the requirements for commissioning and handover. The commissioning manager is supported by the asset acquisition guidelines and asset commissioning guidelines. The Wungong Transfer Main Stage 2 project commissioning was assessed as part of this review. The commissioning tests involved the following assets: • Pipeline; • Surge vessels; • Pumps; and • Regulating valves. The commissioning tests included:	No Recommendations

Test No.	Testing	Observations	Recommendations
		• Water hammer; • Chlorine Residual and Fluoride Dosing; • Surge tests; • Banking; • Pump flows; • Pressure tests; and • Leakage tests. A complete set of documents including test results in spreadsheets were sighted for the project commissioning.	
6.	**Examine whether actual costs are as predicted.**	Projects were sighted on the project management system as well as the close out reports to support this test. The close out reports at the project level identifies the differences between planned and actual costs. In the case of the Armadale McNeil Road SPS project there was a variation between the planned and actual costs of approximately 16.5%. Reasoning for the difference is identified in the close out report as not meeting the time frame, increased labour and material costs, ground conditions and restoration costs. This is used to support the lessons learnt and improve similar projects in the future. A sample of 92 projects was reviewed at the practical completion phase. Only Category A, B and C projects as delivered by Project Management Branch have been included. Only projects where an asset has been acquired	No Recommendations

Test No.	Testing	Observations	Recommendations
		have been included (e.g. investigation projects have been excluded). Projects have been selected that have achieved Project Practical Completion (PPC) between 1 January 2009 and 6 September 2012. The Approved Estimate is defined as the estimate prepared at the Approval to Deliver milestone and then subject to the formal project change control process The Plan Overall could be higher than the Actual to Date as additional costs may still be due after PPC The findings of the review indicate that difference between the actual and planned estimates is approximately 1% with the actual costs being less than the planned costs for a total cost of $2.093Billion.	

Documents sighted

- Asset acquisition definitions, March 2011
- Asset acquisition guidelines, September 2009
- Asset handover checklist template, June 2011
- Doc ID 4539217v4, Activation Phase, June 2012
- Doc ID, 4605691, Asset Acquisition Definitions, March 2011
- Doc ID 2367933, Asset Acquisition Guidelines, September 2009
- Doc ID 4539246v4, Deliver Phase, June 2012

- Doc ID 4539248v4, Handover and Close, July 2012
- Doc ID 4539206v4, Infrastructure Planning Phase, June 2012
- Doc ID 4539210v4, Renewals and Planning Phase, June 2012
- Doc ID 4539237v4, Scope Phase, June 2012
- Doc ID 4539210 v4, Select Phase, June 2012
- PM# 4144599/2, Great Southern Towns Water Supply Scheme, Operating Plan 2011-12
- PM#40230082/4, West Pilbara Water Supply Scheme, Operating Plan 2011-12
- PM-#2116684-v2A-C-W00122 Wungong Transfer Main Stage 2 Integration Commissioning Plan, November 2007
- PM-#2427475-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 2 Regulating Valve 1000REGV2690 Report DRAFT 120809
- PM-#2545913-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Plan Signed, December 2007
- PM-#3244426-v4-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 1 Banking Report & Results, March 2010
- PM-#3478877-v3-C-W00122 Wungong Transfer Main Stage 2 Commissioning Report, August 2011
- PM-#3597590-v1-C-00122 Wungong Transfer Main Stage 2 Commissioning Session 1 NRPS to Wungong Dam Banking Summarised Results March 2010
- PM-#4407121-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 4 Regulating Valve Trials Results November 2010
- PM-#4408008-v2-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 4 Report regulating valve 1000REGV2690 November 2010
- PM-#5308372-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 3 Report July 2010 Banking & Water Hammer Tests
- PM-#5466631-v3-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 5 Results 1000REGV2690 Rev2, April 2011
- PM-#5466656-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 5 Report
- PM-#5506496-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Punchlist
- PM-#6325631-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 6 Regulating Valve REGV2690 Procedure
- PM-#6358205-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 6 Results 1000REGV2690 Kv February 2012
- PM-#3608804-v2-PMB Website Record - Armadale McNeil Road SPS Type 40 - CS01278 - Close Out Report 595, October 2010
- Woodman Point SBR 2, Membrane Upgrade Project C-S21908

3. Asset Disposal

Key Process	Outcomes	Effectiveness Criteria
Effective asset disposal frameworks incorporate consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets. Alternatives are evaluated in cost-benefit terms.	Effective management of the disposal process will minimise holdings of surplus and under-performing assets and will lower service costs.	• Under-utilised and under-performing assets are identified as part of a regular systematic review process • The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken • Disposal alternatives are evaluated • There is a replacement strategy for assets

Test No.	Testing	Observations	Recommendations
1.	**Identification and inspection of disposal and replacement processes documentation.**	Disposal process documentation is provided on the intranet under the following documents: • Policy - PCY342 Decommission and Disposal of Infrastructure Assets, October 2010; • PM-#367588-v5-S087 Disposals Standard, June 2011; • Guideline-Decommission & Dispose Assets, October 2011; • Plan - Decommission & Dispose Assets, October 2011; • PM-#364856-v4-PCY233_Disposals, June 2011; • PM-#6813814-v1-Decommission _& Dispose Assets _- Guideline, October 2011;	No Recommendations

Test No.	Testing	Observations	Recommendations
		• PM-#2492016-v5B-Decommission and Dispose Assets, October 2011; • PM-#6813821-v1-Decommission & Dispose Assets - Plan, October 2011; and • PM-#2759026-v2-Disposed Assets 2008-2009. Replacement process documentation is also included on the intranet under a number of documents including Guidelines for Plan, Monitor & Assess Asset Performance, Condition and Risk Process.	
2.	**Identify replacement strategies and how they are developed and reviewed.**	The Asset Condition Assessment process is in place to guide the capture of asset condition. It has been in place for a number of years. In addition to the ACA, the following are also used to assess replacement: • Asset failures and trends; • Actual levels of service versus planned; • Results of key performance indicators; • Asset Risk Assessment; and • System Risk Assessment. The above activities are also important for forward planning, renewal needs, operations and maintenance planning and identifying assets to be disposed. The ARA process is used as the basis for prioritisation of renewal projects. It examines the risks associated with critical assets and used in the process to prioritise projects across the regions.	No Recommendations

Test No.	Testing	Observations	Recommendations
		The system risk assessment process is used by WaterCorp to identify system based risk. Replacement strategies may result from the identification of projects. The SRA uses risk events for regulated water, regulated wastewater, drainage and irrigation under the following headings: • Quality; • Capacity; • Asset Performance; and • Growth.	
3.	**Identify and review evidence related to performance of assets and reporting on underperforming assets. Determine the frequency of these reviews.**	The performance of the assets and associated reporting is undertaken at a number of levels and frequencies being: • Strategic Asset Management Plan (3 yearly plus 6 to 12 month review); • Asset class plans (As they are developed and updated); • Executive performance report (Yearly); • Operations centre (Daily); • Customer requests (Daily); and • Incident management reporting (fortnightly/monthly/quarterly). Lead teams from regions and business units meet monthly to discuss asset performance and identify actions. The System Capability Forecasting is being developed to	Finish the development of the SCF and implement across the corporation and regions as soon as possible

Test No.	Testing	Observations	Recommendations
		monitor the performance of assets on a continual basis. It is a web based tool with the aim to provide users with the ability to monitor asset performance trends against identified triggers, to then enable better decision making in regards to planning and solution implementation timings. The system uses existing corporate data from systems such as PI, ODDS and Grange. Examples of performance measures include: • Scheme capacity; • Services vs consumption; and • Average day peak week. The SCF has significant potential as it monitors when performance will exceed capability by providing triggers that will assist in the optimisation of planning. Work is continuing on the tool with discussions occurring within the regions to implement the tool.	
4.	**Assess sample jobs and walk through processes. Is there a manual? Review availability and awareness in relation to the manual.**	The primary documents used are the: • Asset Decommission and Disposal Guideline; and • Decommission and Dispose Assets (D&DA) Core Process. In the regions asset disposal usually follows commissioning of new assets. Based on discussions each region has a	An audit programme should be established for assets requiring disposal across the corporation and regions.

Test No.	Testing	Observations	Recommendations
		number of stranded assets. Discussions at North West Region indicate that there have been no assets disposed since 2009. In discussing disposal with personnel, it was clear they were aware of the documentation, the processes and the location of the documents. However as the frequency of asset disposal is infrequent the practical application of asset disposal could not be readily tested. In addition there is some doubt as to who is responsible for managing asset disposal if the disposal is to occur sometime after the project.	
5.	**Random inquiry of staff as to their knowledge of the procedures.**	Water Corporation personnel in Head Office and the North West Region were tested with respect to their understanding of disposal procedures and identification of assets to be disposed. It was found that all personnel have access via the intranet to the documentation and are involved in any discussions on the processes and assets to be disposed. As such they were able to demonstrate a sound understanding and knowledge of disposal procedures. Asset Managers and Capability Managers have been trained in the disposal process.	No Recommendations
6.	**Observation of the documentary evidence of disposal processes being applied to a sample of assets.**	Two projects were identified for review: • Denmark 15ML Tank Inlet & Outlet Pipe Work and Pump Stations; and	No Recommendations

Test No.	Testing	Observations	Recommendations
		• Broome WWTP#2. In both instances the close out reports have a section for the list of assets created and disposed. The Denmark tank close out report identified in the background the assets to be decommissioned namely the Horsley Reservoir high level tank and booster pump and the Christina Crescent tank and pump station. The Broome WWTP #2 project included the creation of assets and while no assets were disposed the section is still recognised in the close out report.	
7.	**Assess the adequacy of the asset disposal processes.**	The asset disposal process is supported by the following documents: • PM-#6813814-v1-Decommission & Dispose Assets - Guideline, October 2011 • PM-#6813821-v1-Decommission & Dispose Assets - Plan, October 2011 These documents provide the guidance, rules and requirements for decommissioning and disposal of assets across the corporation. Asset disposals can be identified from a number of sources including: • Field personnel through inspections and asset	Responsibility for asset disposal should be clearly identified in all situations e.g. post project disposal. All personnel involved in the asset disposal process should be trained in the process from end to end. Develop a 3 to 5 year rolling disposal programme that is monitored as per current programme processes. The programme should become

Test No.	Testing	Observations	Recommendations
		defect reports; • Planners through project planning; • Underperforming assets; and • Maintenance histories. The asset disposal process is extensive and impacts on a number of sections within the corporation including: • Project planning; • Regions; • Strategic asset management (renewals); • Finance; • Corporate Real Estate; and • Information, systems and data. The process is supported by checklists and forms e.g. Notification of Asset Disposal, Deactivate Functional Location Request Form. It is also further complicated by asset disposals falling into two distinct categories: • Capital investment required; and • Capital investment not required. It is because of the number of sources of input, the time between identification and removal of the asset, and the number of groups within the corporation that are involved along the process that there is a risk of the process not being completed for a given asset.	part of the normal project business requirements where it can be reported against and monitored.

Test No.	Testing	Observations	Recommendations
		A program exists and is currently being implemented by the AMB. This is called the Surplus Asset Disposal Program and was designed to remove all assets surplus to operational needs. WaterCorp has now removed assets deemed to be of high risk and it is planned for further surplus asset disposals to be incorporated with normal operational budget submissions. The decommissioning & disposed assets process will ensure assets are disposed as planned and the awareness sessions are designed to accommodate this need. There are 525 individual assets identified as surplus to WaterCorp's operational needs. These are included in a plan that is currently being implemented by AMB. An asset disposal backlog list is available within the Aroona Alliance.	
8.	**Assess whether under utilisation or poor asset performance is critically examined.**	Asset performance is monitored in a number of ways being: • Maintenance histories; • Asset failures and trends; • Actual levels of service versus planned; • Results of key performance indicators; • Asset Risk Assessment (ARA); and • System Risk Assessment (SRA). The performance of the assets is monitored and reported through a number of mechanisms e.g. region monthly reporting, asset class plans and the corporate reporting framework.	No Recommendations

Test No.	Testing	Observations	Recommendations
		As stated previously the newly developed SCF tools will enhance the monitoring of performance and improve the planning of works to overcome performance issues.	
9.	**Assess whether disposal alternatives are evaluated.**	In conjunction with the asset risk and system risk process and as part of the manage asset capability process, the following are assessed: • Change in operations; • Change in maintenance; • Alternative service levels; and • Strategies developed. Assets may be identified for disposal through any of the above steps. However it is treated as secondary to the overall process. Asset disposal is an outcome of completing the above analysis rather than a process in its own right. The system capability matrix (SCM) has been implemented but is not fully implemented. The Optioneering process will also allow disposal options to be examined including options identified above that may defer disposal.	Complete the implementation of the system capability matrix.

Documents sighted

- Guidelines for Plan, Monitor & Assess Asset Performance, Condition and Risk Process, October 2011
- PM-#6813814-v1-Decommission & Dispose Assets - Guideline, October 2011

- PM-#6813821-v1-Decommission & Dispose Assets - Plan, October 2011
- PM-#2759026-v2-Disposed Assets 2008-2009
- PM-#364856-v4-PCY233 Disposals, June 2011
- PM-#367588-v5-S087 Disposals Standard, June 2011
- PM-#404111-v3-PCY268 Water Corporation Accountabilities Framework, November 2011
- PM-#2492016-v5B-Decommission and Dispose Assets, October 2011
- PM-#3955810-v5-PCY342 Decommission and Disposal of Infrastructure Assets, October 2010
- PM-#6813814-v1-Decommission & Dispose Assets - Guideline, October 2011
- PM-#6813821-v1-Decommission & Dispose Assets - Plan, October 2011
- Doc ID 2217251, Plan - Decommission & Dispose Assets, October 2011
- Doc ID 3955820, Policy - PCY344 Managing Asset Capability, November 2010
- Doc ID 3571033, System Capability Matrix - SCM - User Manual, September 2011
- Doc ID 2492016, Guideline-Decommission & Dispose Assets, October 2011
- Doc ID 2217251, Plan - Decommission & Dispose Assets, October 2011
- Doc ID 3955810, Policy - PCY342 Decommission and Disposal of Infrastructure Assets, October 2010

4. Environmental Analysis

Key Process	Outcomes	Effectiveness Criteria
Environmental analysis examines the asset system environment and assesses all external factors affecting the asset system.	The asset management system regularly assesses external opportunities and threats and takes corrective action to maintain performance requirements.	• Opportunities and threats in the system environment are assessed • Performance standards (availability of service, capacity, continuity, emergency response, etc) are measured and achieved • Compliance with statutory and regulatory requirements • Achievement of customer service levels

Test No.	Testing	Observations	Recommendations
1.	**Inspection of the policies and process documentation.**	The key document is the accountabilities framework - PCY268 Water Corporation Accountabilities Framework. It was developed in 2004 to clarify accountabilities and empower managers and employees. The framework is a mature document and clearly articulates the customers, services, processes and accountabilities for process owners and process managers. The accountability framework is currently being updated as a result of the latest restructure. The "From Strategy to Action Roadmap" articulates the capital planning process which is underpinned by the Environmental Scan process. The business planning process is an enabling process	No Recommendations

Test No.	Testing	Observations	Recommendations
		within the Accountabilities Framework. It is referred to as "Manage Strategic Direction". The Environmental Scan process also inputs into and is aligned with the Strategic Risk Profile. Environmental scanning is used to identify existing and future threats and opportunities in moving forward. Together with the Strategic Risk Profile it allows the Corporation to assess the impact of the threats and then to plan actions to prepare for them. From this process the following documents are prepared: • Customer Strategy; • Operation Strategy; and • Strategic Asset Management Plan.	
2.	**Identify evidence of performance standards and reporting.**	Performance standards and reporting are addressed through the Business Performance Reporting System. Reporting is addressed at Corporate, Division and Branch/Region levels. The standards are based on the customer charter, legislative and regulatory requirements. Reporting is undertaken monthly to check for compliance. Process Managers have KPI's set to report against the standards. Typical performance standards measured include:	No Recommendations

Test No.	Testing	Observations	Recommendations
		• Financial Performance; • Operating Licence; and • Business Targets. At other levels performance standards include: • Project costs and timing; • No. incidents; • Continuity of water supply; • Wastewater overflows; • Water pressure and flow; • Leaks per 100 kms; and • Sewer blockages. Internal performance standards also exist for WaterCorp personnel e.g. number of condition assessments undertaken per year and assets having complete attribute data as required by the Corporation. These KPI's are monitored monthly and where breaches occur they are reported at regional level to be addressed by the asset managers.	
3.	**Investigate performance breach for observation of documentary evidence of investigations and corrective actions.**	At the Corporation level WaterCorp complies with its operating licence, customer, regulatory and legislative requirements. Legislative requirements are measured from: • Water Corporation Operating License (Economic Regulation Authority);	No Recommendations

Test No.	Testing	Observations	Recommendations
		• Memorandum of Understanding between Health Department of Western Australia and Water Corporation for Drinking Water; • Australian Drinking Water Guidelines 2004; and • Framework for the Management of Drinking Water Quality. A review of the KPIs from the National Performance Framework in 2009/10 concluded that there was no KPI that was non-compliant. Price Waterhouse Cooper reported that: *"In summary, we noted that none of the 68 indicators reviewed were determined to be non-compliant. Of these, seven indicators were determined to be substantially (materially) compliant. These have been summarised into the six findings included above. For two of these seven indicators, the exception only relates to Perth. All other indicators were determined to be compliant and as such confirm the reporting performed by the Corporation to the Economic Regulation Authority".* Monthly reporting at Division and Branch/Region level may identify internal non compliance. Where there is a breach, actions are identified to address the breach. This is evidenced within the SAMP where trends are plotted against KPI's and monitored. For the year 2011/12 the one indicator (Environmental non-compliance) reported by DEC for the month of June showed one non-compliance issue. This non-compliance	

Test No.	Testing	Observations	Recommendations
		was attributed to the lack of a flow meter to measure cumulative volumes of treated WWTP discharged from the plant. A strategy is in place to prioritise the installation of flow meters at all sites currently without flow meters. Significant failures include: • Faulty Butterfly Valve on Woodman Point Effluent System; and • Woodman Point Primary Sedimentation Tank failure. Both failures have had Root Cause Analysis Reports completed (Sighted).	
4.	**Inquiry of staff as to application of general or specific corrective actions.**	Actions vary depending on the type of breach. They may result in: • Changes in asset operations; • Changes to contingency plans; • Changes in asset maintenance; • Capital projects; • Disposal of the assets; and • Programs initiated to monitor performance e.g. CCTV. Specific actions relate to specific incidents e.g. review the operating strategy, storage of spares; vegetation clearance programs e.g. fire breaks and safety risk	No Recommendations

Test No.	Testing	Observations	Recommendations
		assessments.	
5.	**Examine if customer service levels have been achieved.**	The Board Executive Pack June 2012 provides the reporting required from the BPR and associated key performance indicators. Of these indicators the customer service levels are recorded under the following categories: • Service Customers; • Deliver Services; • Manage Infrastructure Assets; and • Manage Drinking Water Quality. Of the 13 indicators measured only one indicator (Water Quality Faults Responsiveness) did not meet the intended target. The target for the year 2011/12 was 95% fault responsiveness however the actual performance was 94.5%. This represents a non-compliance for this one indicator. Overall however a strong compliance to all indicators was experienced for the year. Examining this further it is noted that Perth region achieved the target however the overall rolling year performance fell marginally below target primarily due to a water quality incident in Australind/Eaton.	No Recommendations
6.	**Identify whether opportunities and threats in the system environment have been assessed.**	Environmental scanning is the process undertaken to identify the future challenges facing the Corporation. The aim of the Environmental Scan is to provide suitable	No Recommendations

Test No.	Testing	Observations	Recommendations
		background to the strategic issues that are likely to form challenges for the Corporation. The annual scan presents a Political, Economic, Socio-Cultural, Technological and Ecological (PESTE) analysis focused on a (4-20 Year) outlook. As part of this process operations and threats are identified for analysis to map out the road ahead globally, nationally, regionally and locally. This scanning is undertaken by the Corporate Planning Branch as an input into the "Plan Corporate Strategic Direction" process. Scanning is also undertaken at the branch level. It allows the corporation to identify issues and plan for them. Workshops are undertaken to identify and rank issues. Environmental scanning is also undertaken monthly to monitor previously identified issues and identify any emerging issues.	

Documents sighted

- Accountabilities Policy – PCY 268
- PM-#404111-v3-PCY268 Water Corporation Accountabilities Framework, November 2011
- Water Corporation, Customer Charter
- Water Corporation Organisational Structure

- Doc ID 1818884, Corporate Environment Scan March 2009
- From Strategy to Action Roadmap, 2011/12
- PM#617596v1 - Water Corporation 2006-07 National Performance Framework Review Final Report - 06 Nov 07
- PM-#4640032-v4A-110308 WC Environment Scan #4530221 FINAL, March 2011
- PM-#5870235-v9-111005 Water Corp - Environment Scan, January 2012
- PM-#6921078-v1-120524 WaterCorp News Analysis - End 25 May 2012
- PM-#6977327-v2-120605 WaterCorp News Analysis - End 8 June 2012
- PM-#5630577-v5-Corporate SCADA Strategy 2011, December 2011
- PM-#7174962-v1-ERA Pricing Inquiry 2012 Cardno Report Capex Opex Review Water Corporation Draft v2, June 2012
- Levels of Service Register- Woodman Point
- Woodman Point WWTP - Balancing dam information Sept 11
- Woodman Point - Valve Incident memo Nov 2011
- RCA Report - Woodman Pt PST System
- Board Executive Pack, June 2012

5. Asset Operations

Key Process	Outcomes	Effectiveness Criteria
Operations functions relate to the day-to-day running of assets and directly affect service levels and costs.	Operations plans adequately document the processes and knowledge of staff in the operation of assets so that service levels can be consistently achieved.	• Operational policies and procedures are documented and linked to service levels required • Risk management is applied to prioritise operations tasks • Assets are documented in an Asset Register including asset type, location, material, plans of components, an assessment of assets' physical/structural condition and accounting data • Operational costs are measured and monitored • Staff receive training commensurate with their responsibilities

Test No.	Testing	Observations	Recommendations
1	**Identification and inspection of process documentation and linkage to service levels.**	The Asset Management branch has developed process documentation to implement and monitor effective asset operations processes. This documentation includes: • Infrastructure Asset Management Policy; • Scheme and Asset Operations Policy; • Plan Asset Operations Procedure; • Scheme Operations Plan Index; • Scheme Operating Plan templates; o 'Whatscheme' Water Supply Scheme Operating Plan 2012 – 2013; o 'Whatname' Scheme Operations Plan – Process Control Table;	No Recommendations

Test No.	Testing	Observations	Recommendations
		• Plan Asset Operations Core Process; • Safety, Security and Environmental (SSE) inspection maintenance standard; • Guideline for Plan, Monitor and Assess Asset Performance, condition and Risk Process; and • Safe Work Method Statements e.g. Safe Use of Climbing Systems, Working on contaminated sites, Asbestos pipe removal and disposal.	
2	**Assess the adequacy of training and testing of operator's ability to operate the infrastructure.**	All staff training is managed through the Learning and Development System (LMS) (coordinated by Head Office). The training and testing of operators varies between the type of personnel used: • Civil assets (non trade personnel) meet certificate 2 & 3 of national qualifications; and • Mechanical & Electrical (trade personnel) subject to standard qualifications. Personnel also undergo yearly safety training. A training needs analysis is undertaken for each district in the north west region to identify training needs. All operators have performance service agreements in place with the Corporation. As part of this, training requirements are identified in line with prospects. The established budget is then matched against the training load. Training records are stored in the corporate LMS. The LMS	Extend current training to provide operators in the field with the importance of data collection, the role they play in asset management and how their job is important to the greater business outcomes.

Test No.	Testing	Observations	Recommendations
		then advises the manager of pending training expiries. Typical training involves confined space, water sampling etc. The training process contains a skills recognition process for water industry workers which recognises prior learning of operators. As an alternative to formal off-the-job learning and assessment courses, personnel may choose the skills recognition pathway. Details are contained in the 'Skills Recognition Process for Water Industry Workers' document. For example – Woodman Point WWTP: • There is a wastewater training profile available across the Corporation; • Every month groups are monitored for training progress; and • 2 training coordinators are available in the Aroona alliance. Their role is to coordinate and monitor training of staff. The training coordinator reminds staff when training requirements are due. Supervisors then schedule the necessary training for operators between jobs. Training is audited and regularly monitored and corrective action is taken when training is carried out. In addition to this an on-line training booking system is available in Cascade to appoint training as required. The North West Region:	

Test No.	Testing	Observations	Recommendations
		• Recognises the training package managed by the Leadership and Learning Group located in Perth; • Use the training process (skills recognition process); • Work with their operators to achieve Cert 2 (water) and Cert 3 (wastewater) qualifications; • Uses the LMS system to track training statistics and schedule of training (this occurs at a state-wide level through the LMS) – system auto generates email alerts when skills need to be refreshed; • OHS training is refreshed regularly through the LMS; • Equipment training is undertaken as part of any equipment implementation process. Traccess within the LMS lists all training completed by personnel. It includes OHS and all mandatory training. Any one-off training is coordinated by Karratha (regional office). The 'East Pilbara Training Record' report shows over 20 different training records for some operators plus repeat refresher records.	
3	**Review asset register for operations content e.g. operational procedures, activity and costs.**	Assets are located in the FLER (Functional Location Equipment Register) asset register within SAP/PM Financials. Assets are structured by hierarchy and key attributes (characteristics) are captured. The type of data included in SAP/PM includes locational data, asset technical data e.g. asset dimensions. Other data recorded in separate modules of SAP and other applications include accounting data, condition, risk, operations activities and budgets/costs. A process was in place	Asset related data capture should be embedded into normal operational activities.

Test No.	Testing	Observations	Recommendations
		to capture the attributes where gaps exist. This data capture program was monitored monthly through KPI reports that identified the attributes not captured by asset for each asset class. The process referred to above originated from the FLER Improvement Project and established a FLER characteristic audit which was attempted to be operationalised in the regions. The implementation was not successful due to competing priorities for available resources. This Asset Management review identified the need for better management, including auditing, of asset data. Processes and mechanisms are currently being considered to provide appropriate management assurance. At a broader level the Corporation has also created an Information Management Competency Centre which has the key objective to assist the business better understand, manage and improve its data quality. Based on the review gaps in the asset and asset attributes currently exist. Also the maintenance data being recorded in the region reviewed is inconsistent and difficult to interpret. Operational costs are reported monthly through the Business Performance Reporting process. Variances in costs and budgets are identified and discussed at Region and Branch level. Operational procedures are scheduled through Activity Based	

Test No.	Testing	Observations	Recommendations
		Planning (ABP) in SAP. The schedules include the activity type i.e. meter reads, inspections, estimated cost and due date. SAP automatically schedules the activity to the PDA's for execution by the operators in the field. Results are entered back into the system via the PDA and results are recorded against the activity. The business at this time reviews the SAP system operational activity feedback in an ad-hoc manner. This is recognised within areas of the business and with the Asset Management Information Systems section formation one of the areas of responsibly identified was the need to audit asset information in a more structured way. The development and implementation is still to occur.	
4	**Review effectiveness of the assets themselves.**	Performance monitoring at an operational level is monitored against two criteria within the process control tables (~80% state-wide): • Critical control points (CCP); and • Process control points (PCP). The Aroona Alliance are familiar with the Process Control Tables: • Used to compare operations against process control points; and • If results are different to set trigger points, an Asset Deficiency Report (ADR) is produced (typically	Work towards the monitoring of Process Control Points for all treatment plant.

Test No.	Testing	Observations	Recommendations
		mechanical and electrical equipment). Woodman Point WWTP - Process Control Tables: • Monitors all processes on-site; • Tracks against design data; • Monitors set points with different limits and alerts; • Contains both PCP's and CCP's. Critical control reports are generated weekly with a monthly view. Trends are reviewed with managers each week. The reports contain CCP's such as: • Suspended solids; • Ammonia; • Hydrogen Sulphide (stack outlet); • Air Flow – stack outlet; • Digester Temperature; and • Time sludge in digester. Woodman Point WWTP is working towards also monitoring and reporting against PCP's. If an exceedence is experienced, the following process is followed: • Advise within 24hrs of exceedence with a letter of findings in 7 days; • Plant Manager advises/escalates information; • Communicates with Department of Environment and	

Test No.	Testing	Observations	Recommendations
		Conservation (DEC); • Exceedence report includes investigation solutions attached to the letter; • Key information on monitoring is identified and contained in the monthly Audit Compliance Reports (ACR); and • Annual Environmental Report (AER) sent to DEC. In addition to the above, Woodman Point WWTP monitor performance through: • Water quality sampling managed through the scheduling system (WWQMS); • Monitoring and reporting of the ocean outfall is undertaken by a contractor; and • Chemical usage at the plant is tracked weekly. WWQMS schedules both: • Regulatory samples (undertaken off-site); and • Operational samples (undertaken on-site -day to day and weekly). Every month, additional on-site lab tests are taken to check results of external labs to ensure results are consistent and accurate. Results of scheduled samples are entered into the Operational Data Support System (ODSS). Manual sampling results are initially collected on log sheets and data is entered into the	

Test No.	Testing	Observations	Recommendations
		system at a later stage e.g. power usage figures. Monitoring reports are generated in excel. Water production and wastewater treatment use on-line monitoring to track the operational performance of the site. Operational performance is tracked against set triggers that have been developed to ensure the required levels of service are achieved. Anything outside the boundaries is investigated and actioned accordingly. Country schemes use the operations plan coupled with the process control table. The Corporation pro-actively assesses schemes annually under the SRA framework: • Is the scheme performing?; and • Has the risk level changed? <u>Failures at Woodman Point WWTP:</u> Woodman Point Sedimentation Tanks failed on 13th October 2010. As a result of this incident the Woodman Point effluent quality exceeded its target. Details are contained in the 'Woodman Point Primary Sedimentation Tanks – Incident Report'. Butterfly valve failure on the balancing dam gravity pipe at Woodman Point in 2011 resulted in a high water level in the dam. Details are contained in the 'Valve Incident Memo November 2011'.	

Test No.	Testing	Observations	Recommendations
5	**Assess the use of risk to prioritise operations tasks.**	SCM ranks schemes using a Risk Matrix developed by the Operations Centre. The matrix determines high and low risk schemes which is applied to the production of operations plans: • High Risk - Schemes will attract a full Operations Plan; and • Low Risk – Schemes will only require current key documents. For example – Water Safety Plan, Abstraction Data for Bores (LOS in terms of Water Quality & Quantity) and a Scheme Schematic. SSE inspections are undertaken at site level and the frequencies and category of inspection applied to any given site is determined using risk. The SSE inspection risk levels have been broadly based on the complexity of workplace (associated hazards) and likelihood based on the intensity (degree) of occupation and activity. The four risk levels are as follows: • Category A – High Risk (high intensity of staff 'staffed' and high intensity of activity) • Category B –Medium Risk (low intensity of occupation 'unstaffed' and medium intensity of activity); • Category C – Low Risk (low intensity of risk); and • Category D – Wildcards (no generic sites with special risks).	No Recommendations

Test No.	Testing	Observations	Recommendations
6	**Test application of procedures over the review period.**	A review of the operations procedures indicated that the procedures identified above either at Corporate or the regional level are followed on a daily basis. This is evidenced by the use of available systems, asset reporting, data collection, condition assessments, risk analysis and the monitoring of performance through KPI's for the operational activities.	No Recommendations
7	**Test analysis of costs and actions to correct significant variation.**	The operating costs are reported monthly as a part of the monthly business reporting and reported against budget costs. Should there be a significant cost change, actions are undertaken to address the variance. The Asset Management Branch investigates the variance to identify whether: • The asset's operations plan should be modified; or • Capital invested to upgrade or replace the asset. An example of this is identifying and initiating projects to reduce energy costs. In addition to the above, risks are reviewed to identify the projects and their priority. The operating business reports sighted included: • NW Region Report; • MW Region Report; • Perth Region Report; and • Summary Report.	No Recommendations
8	**Review operation and maintenance plans for completeness and check that they**	The 'Scheme and Asset Operations' policy ensures that the intent of the operating strategy is translated into scheme operation plans and that those plans are executed efficiently.	No Recommendations

Test No.	Testing	Observations	Recommendations
	are up-to-date	Its purpose is to optimise the balance between: • The flow and quality of water and wastewater; • The asset life, and • The use of resources – energy, chemicals and labour. The production of Scheme Operating Plans is supported by the 'Plan Asset Operations Procedure' which has been created to ensure that stakeholders have a common understanding on the creation and use of the Scheme Operating Plans. Scheme Operating Plans determines the scheme operating requirements across all business lines and plans how assets will be utilised and operated to optimally deliver the required outcomes. Coupled with the operating plans is a Part B – Process Control Table which describes the agreed optimal way of operating the scheme. System Operating Plans Part A and B are developed for high risk schemes. Water Safety Plans are created for low risk schemes. The Scheme Operating Plans inspected were: • Bridgetown Greenbushes Regional Water Supply Scheme Part A 2011-2012; • Bridgetown Greenbushes Regional Water Supply Scheme Part B - Process Control Table; • Esperance Water Supply Scheme Part A 2011-2012; • Esperance Water Supply Scheme Part B - Process Control Table;	

Test No.	Testing	Observations	Recommendations
		• Hopetoun Water Supply Scheme Part A 2011-2012; • Hopetoun Water Supply Scheme Part B - Process Control Table; • Port Hedland Wastewater Treatment Plant – Process Control Table; • South Hedland Wastewater Treatment Plant – Process Control Table; • North West Region – Marble Bar - Water Safety Plan; and • North West Region – Hedland - Water Safety Plan. All plans are current as of 2011-12 and appear to be complete.	
9	**Assess whether operational checklists are available and used by the operators**	Operational checklists are available for personnel who attend site. These checklists include: • Process coordinators' checklist; and • Daily pre-start meeting form. The following checklist requirements are in place: • Complete a Job Safety Analysis for high risk – non standard jobs; • Complete a Job Hazard Analysis (JHA) for low risk jobs; and • Work in line with the appropriate Safe Work Method Statements' for all standard jobs. JSA and JHA activity is reported fortnightly. Completed JSA's sighted:	No Recommendations

Test No.	Testing	Observations	Recommendations
		• #3 SPS Paton Rd South Hedland. Completed JHA's sighted: • #261451; • #204589; and • #204063. It is the responsibility of all present at site to check the surrounds and report anything abnormal through the asset deficiency request (ADR) system or via the hazard identification form system. Crew members each carry an ADR booklet and hazard identification booklet in their vehicles. Work instruction checklists are used as part of SSE inspections and the completion of these checklists are supported by training of personnel. Operational checklists are completed as part of jobs on site and various checklists are completed on the PDA devices.	
10	**Assess identification of operational risks and implementation of any required actions**	Operational risks are most commonly OSH risks which are identified through the OSH risk profile at a corporate level and identified through the safety inspections, SSE inspections or hazard identification process at the site/asset level. The OSH corporate risk profile considers the following: • Risk identification; • Current Residual Risk; • Risk Status; and • Risk Treatment Plans.	No Recommendations

Test No.	Testing	Observations	Recommendations
		Regular operational inspections are undertaken to identify any risks on site such as OSH, environmental etc. Random audits by the regional operation managers are also undertaken to ensure safe work practices are followed at all times. Safety issues are actioned as appropriate and registered in SiteSafe.	
11	**Test if inspections of the infrastructure are undertaken on a frequent basis to identify issues and program works where required**	Three types of inspections are undertaken on a regular basis: • WC-OSH16 Safety Inspections; • Safety, Security and Environmental (SSE) Inspections; and Owner/Occupiers Liability Inspection. OSHB is custodian of WC-OSH 16. Table 1 of WC-OSH 16 requires an OSH inspection of staffed operational sites each month, staffed offices each quarter, or other staffed sites at risk-based intervals. For normally unstaffed sites, WC-OSH 16 doesn't require a discrete OSH inspection, but references the integrated SSE inspection process instead. In reference to the categories described in Test No. 6, typically Category A assets require a formal safety inspection at the frequency nominated in WC-OSH 016. Category B requires an SSE inspection at the frequency nominated in the 'SSE Inspection – maintenance standard' e.g. weekly, every 4 weeks and every 13 weeks depending on the risk at the site and the assets involved – risk of pump station overflow. Category C assets require JSA and standard operating procedures to provide the controls and reporting mechanism at this level.	No Recommendations

Test No.	Testing	Observations	Recommendations
		Category D assets may require an SSE inspection as directed. Owner/Occupiers Liability Inspections are undertaken at category A, B and D levels. The frequency of inspections varies with location e.g. Water Storage Complex – weekly for Perth and Major Regional Centres and every 4 weeks for complexes outside Perth and Major Regional Centres. The integrated SSE inspections are governed by the AMB maintenance standard. SSE inspections are scheduled in SAP PM at risk based intervals. Largely these also are achieved through the integrated SSE inspections. SSE inspections are carried out by the Corporation's Operational Personnel who are familiar with the site and its operating context. In addition to the above the following inspections are undertaken on an as needed basis: • Asset integrity / functionality / compliance inspections by specialised persons (examples: Crane Inspections, Pressure Vessel certification and RCD testing); • Other specific assessment processes (example: Asbestos inspection); • Specialised inspection or audit by qualified Engineering, Security or Environment experts (examples: Environment Audits, Security Assessments); and • Dangerous Goods Management Requirements (S350).	

Test No.	Testing	Observations	Recommendations
		SG081 Site Security and Public Safety guidelines specify the frequency of site security and public safety inspections. Nominally the frequency is dependent on the asset category as follows: Category A – 2 yearly Category B & C – 4 yearly Category D & E – 6 yearly It should be noted however that these inspections may be conducted concurrently with other inspections or visits. The knowledge of the operations manager in Port Hedland was tested on the types and frequency of inspections undertaken. The response identified: • Owner and occupier inspections at site level; • Regular checks/servicing of equipment e.g. cranes, gantries; and • Site safe and hazard identification inspections when on site. Low level corrective actions are undertaken at the time of the visit however any findings requiring further actions are reported to the relevant Supervisor for escalation in accordance with other corporate processes. At Woodman Point site inspections are:	

Test No.	Testing	Observations	Recommendations
		• Combined inspections with tasks planned on work orders in SAP; • Reported through the balance score card and OHS system; and • Scheduled as part of the normal activity based scheduling system.	
12	**Check SCADA has been installed and implemented to monitor infrastructure performance, alarms occur on fault/failure and performance information is recorded, reported and analysed**	SCADA is installed at all critical sites in the metro and regional areas. Dial up (alarm dialers) are still being used in various country areas. The treatment plants use Citect to communicate to the Operations Centre. Serck controls are used at the Wastewater Pump Stations in the metro area. Simple schemes use alarms as the primary monitoring method and the Integrated Water Supply Schemes (IWSS) use supervisory control. SCADA has been installed at all pump stations operated in the North West Region besides the Number 5 sewer pump station at Newman. It is envisaged that the Number 5 pump station would receive SCADA as part of a station upgrade project. The station currently has an alarm dialer system. A recent SCADA policy PCY267 is available 'Creation and Support of SCADA Systems' which ensures a consistent, whole of business approach to the creation and support of SCADA systems. A SCADA Corporate Strategy has been developed and explores the rationale for investment in SCADA and related	Develop a plan on how to utilise SCADA data for all asset classes e.g. Data to be used, what purpose and what asset class. Incorporate use of Data Historian within the plan.

Test No.	Testing	Observations	Recommendations
		technologies, the approach to deployment and the ongoing maintenance and support arrangements required. The Strategic Investment Business Case (SIBC) for continued deployment of SCADA and associated technologies was approved in September 2011. The SIBC describes a number of options available to the business in terms of progressing changes in the Operational Information and Control technologies over a 20-year horizon. It aims to describe, for each option, the expected outcomes and investment required. A SCADA Asset Class Plan was finalised in March 2011 and outlines a formal lifecycle management plan for the Water Corporation's SCADA and Plant Control Systems based on the expectation of the asset class and its past performance. The Corporation is currently using data historian however are not yet utilising the modelling component of the software. The data within historian is used to predict faults (predictive modelling) of pump stations but not for all asset classes.	
13	**Review the asset register for the physical condition and location of assets**	The physical condition of assets is recorded in the Corporation's Asset Condition Assessment (ACA) module within the SAP system. The physical condition is not stored within the Functional Location Equipment Register (FLER). Instead, access to condition information against the asset must be viewed through ACA. The location of mechanical and electrical assets is recorded in the FLER, however linear assets such as water and sewer pipes	No Recommendations

Test No.	Testing	Observations	Recommendations
		are stored in the GIS. Any locational information for linear assets must be accessed through the GIS. For example, as seen in SAP: • Functional Location: W0041797; • Description: Pump Bore 2/86 Kalbarri; • MainPlant: 0060 (Geraldton Operational Depot); • Location: GN (Geraldton); • Region/Branch: MW; • Plant Section: GM (Geraldton Mur.); and • Suburb/Town: Kalbarri.	
14	**Assess whether costs are monitored.**	Costs are captured against operational activites and inspections within SAP. Planned activities and inspections are scheduled from SAP, before the activity is scheduled a cost is estimated and on completion of the job actual costs are recorded against the activity. This process is known as 'Activity Based Planning'. This process allows the user to monitor variances between what has been planned and what was delivered. These variances are regularly reported as part of the ABP process. Refer Test No. 8 for detail on business operating reports. As part of the audit Odysseus-imc sighted 4 Activity Based Planning (ABP) Reports. Reports sighted included: • NW Region Report; • MW Region Report; • Perth Region Report; and • Summary Report	No Recommendations

Test No.	Testing	Observations	Recommendations
		As part of the audit the estimated (forecasted) and completed (actual) costs were reviewed. For all regions reported it appears that the forecast and actuals costs for planned activities (preventative scheduled maintenance) and inspections (condition based and operational) do not necessarily match as variances are readily identified in the reports. The ABP process identifies variances however the steps involved to manage variances are taken quite seriously. Variances are discussed at monthly management meetings where topics of discussion include: • Performance reports by priority number (how are planned activities and inspections performing); • Any Backlog; • Preventative vs. corrective maintenance; and • Actions for improvement to be implemented by the Asset Manager.	

Documents sighted

- S110 Incident Management, 29 September 2009
- PM-#3655044-v1-Plan Asset Operations Process and Guideline, June 2014 (or 2012)
- PM-#3088972-v8-Desludging Process - Assessment Planning and Operation, July 2012
- PM-#3254672-v1-S394 Pressure Sewer Systems - Grinder Pumps - Under Review, Nov 2009
- PM-#3518204-v3-Trunk and Distribution Mains Risk Based Inspection Procedure, July 2010
- PM-#3955868-v4A-PCY340 Scheme and Asset Operations, November 2010
- PM-#4825140-v1-Bridgetown Greenbushes Regional Water Supply Scheme Operating Plan-Process Control Table-Part B, July 2011 to June 2012

- PM-#4653005-v1-Bridgetown Greenbushes Regional Water Supply Operating Plan-Process Control Table-2011-2012, Part A
- PM-#5562607-v2-ESPERANCE Water Supply Scheme Operating Plan-Process Control Table-Part B, July 2011 to June 2012
- PM-#5540861-v1-ESPERANCE Water Supply Scheme, 2011 to 2012
- PM-#4465661-v4-Hopetoun Water Supply Scheme, Operating Plan 2011-2012
- PM-#4351171-v4-Hopetoun Water Supply Scheme Operations Plan – Part B, 2011 to 2012
- Doc ID 3955868, pcy340-Scheme and Asset Operations, November 2010
- Plan Asset Operations, June 2014 (or 2012)
- PM # 2347410.v13-Safety, Security and Environmental (SSE) inspections, May 2011
- Scheme Operations Plans Index
- PM-#3948919\4-Whatscheme Water Supply Scheme Operating Plan 2012 - 2013, Part A
- PM-#3948921\4-Whatname Scheme Operations Plan – Process Control Table Template
- Doc ID 5711368, SWMS - Blockages Port Hedland, October 2011
- Doc ID 4121126, Training Process
- PM-#457125-v3-PCY298 Buried Asset Damage Prevention, April 2011
- PM-#459635-v3-S151 Annex A to Appendix 2 Schematics of Key Criteria, August 2007
- PM-#459636-v3-S151 Annex A to Appendix 3 Risk Profile - Working at Heights, August 2007
- PM-#459638-v2-S151 Annex B to Appendix 4 Inspection of Equipment, August 2007
- PM-#459639-v4-S151 Appendix 1 Definitions References and Standard Drawings, August 2007
- PM-#459641-v3-S151 Appendix 3 Working at Heights Risk Management, August 2007
- PM-#459642-v2-S151 Appendix 4 FIPS Prevention of Falls Standard, August 2007
- PM-#459643-v3-S151 Appendix 5 Competencies, August 2007
- PM-#459644-v3-S151 Appendix 6 Guide to Rescue Planning, August 2007
- PM-#580769-v1-S151 Annex A to Appendix 4 Guide to Types of FIPS for Use in the WC, August 2007
- PM-#580770-v1-S151 Appendix 2 Summary of Key Criteria for Prevention of Falls Standard, August 2007
- PM-#580792-v6-S151 Prevention of Falls, July 2010
- PM-#4520405-v1-Woodman Point PST RCA – October to November 2010, March 2011
- PM-#5827623-v3-Woodman Point WWTP - Cape Peron Effluent Pipeline - Control Valve, November 2011
- PM-#7387871-v1-AMSER 2012 Audit Asset Operations Session, July-August 2012
- PM-#7568694-v1-East Pilbara Training Records 05 09 2012
- Corporate SCADA Strategy, December 2011
- Doc ID 368565.V2.1, SCADA Infrastructure Plan, January 2006

- SCADA key document relationships, April 2012
- PM-#4619204-SCADA System Asset Class Plan - Published Version 1, March 2011
- SIBC OIC SCADA, May 2011
- PCY267 - Creation and Support of SCADA Systems - 15 November 2011, February 2012
- PM-#7574000-v1-Operator Checklists- Process Coordinators Checklist Woodman Point WWTP
- PM-#7574021-v1-Pre Start Meetings- Daily Pre-start Form
- PM-#7572690-v1-BPR – Wastewater Treatment Performance Scorecard, July 2012
- Doc ID 4121126, Skills Recognition Process For Water Industry Workers Valve Incident Memo - Faulty Butterfly Valve on Woodman Point Effluent System, Nov 2011
- Incident Record #4065 – Woodman Point Primary Sedimentation Tanks, October 2010
- Woodman Point WWTP - Balancing dam information Sept 11
- Woodman Point Valve Incident Presentation to WW Governance Committee Dec 11
- PM-#2697658-v5A-WC-OSH-SWMS-002 Asbestos Pipe Removal and Disposal, October 2010
- PM-#4868521-v2-WC-OSH-SWMS-084-Safe Use of Ladder Climbing Systems, May 2011
- PM-#6966848-v1B-WC-OSH-093-SWMS Working on Contaminated Sites, October 2011

6. Asset Maintenance

Key Process	Outcomes	Effectiveness Criteria
Maintenance functions relate to the upkeep of assets and directly affect service levels and costs.	Maintenance plans cover the scheduling and resourcing of the maintenance tasks so that work can be done on time and on cost.	• Maintenance policies and procedures are documented and linked to service levels required • Regular inspections are undertaken of asset performance and condition • Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule • Failures are analysed and operational/maintenance plans adjusted where necessary • Risk management is applied to prioritise maintenance tasks • Maintenance costs are measured and monitored

Test No.	Testing	Observations	Recommendations
1.	**Identification and inspection of procedural documentation.**	The maintenance management group within the Asset Management Branch has developed process documentation to assist the Regions and the Alliance to implement and monitor effective asset management processes. This documentation includes: • Maintenance Policy; • Maintenance Standards; • Maintenance Plans; and • General Work Instructions.	Continue to review and complete process documentation including maintenance standards and procedures.

Test No.	Testing	Observations	Recommendations
		The above documents provide the link between strategy and service delivery.	
2.	**Random inquiry of staff as to the knowledge of maintenance staff of procedures.**	Water Corporation personnel in Head Office and the North West Region were tested with respect to their understanding of maintenance procedures, their location, content and intended purpose. Personnel have access via the intranet to the documentation and are involved in any discussions on the processes. The maintenance personnel were able to demonstrate a sound understanding and knowledge of maintenance procedures. The M&ESB is a specialist branch supporting the regions and alliance with respect to the maintenance of mechanical and electrical (M&E) assets. This branch has intimate knowledge of the required maintenance of M&E assets and as such have input into maintenance standards. All documentation including procedures are available through the intranet and accessible by all personnel.	No Recommendations
3.	**Test application of procedures over the review period.**	The maintenance standards are stored in a library and incorporated in SAP for new assets. 83% of the asset base is covered by the new generation maintenance standards. A central maintenance team is being formed to facilitate the incorporation of the maintenance standards and will also cover maintenance planning for new assets A review of the maintenance procedures indicated that the	Complete the maintenance standards for the asset base. Document the process for incorporation of maintenance standards for new assets.

Test No.	Testing	Observations	Recommendations
		procedures identified above either in the alliance or the regions are followed and incorporated in work orders. This is evidenced by the use of available systems, maintenance histories/records for the alliance and the North West Region, risk analysis and the monitoring of maintenance performance through KPI reporting for the activities.	
4.	**Do sample walk through of riskier assets.**	This process incorporated a walk through maintenance planning & execution in the SAP PM application. In doing so the following was sighted: • Chlorination Assets - Maintenance Standard for water quality - Monthly Chlorination execution Report - Discrete Chlorination Facility work orders; • Wastewater PS "Riverwise" - Environment maintenance standard - WWPS execution report - Environmental monthly trigger report; and • Discrete High Risk "Riverwise" WWPS Armagh St & Murdoch Drive. These assets are supported by (all sighted): • Maintenance Standards (New Gen); • Generic Work Instructions Elect/ Mech/Civil; and • Continuous Improvement Register.	No Recommendations

Test No.	Testing	Observations	Recommendations
5.	**Review evidence of inspections for asset performance and condition. Review condition manual for consistency of approach.**	Asset condition assessments (ACA) are undertaken as an ongoing process and reported monthly for review of performance. Condition manuals have been developed for each asset class and available on the intranet. The condition rating is a 1 – 5 rating criteria supported by asset specific definitions. Even so the ratings are consistently applied across assets. Supporting the condition criteria is a gap treatment program that identifies the condition of the assets against the intended service level/performance. This is a +2 to -2 rating which is used to determine the likely treatment to close the gap. The inspections are also supported by asset deficiency reports (ADR), which allow inspectors to document identified faults/issues against assets. In undertaking condition assessments as a first stage they are visual. However, if further assessment is required it will be undertaken by specialists who will then produce a report with recommendations. Asset deficiency reports undertaken as part of normal operations are collated and used to determine either maintenance work or recorded in the asset condition assessment database for treatment application. While on-site the Karratha tank #3 (25 ML) underwent an Asset Condition Assessment (ACA) audit. Previous ACA data was extracted from the system along with ADR reports. SAMB personnel completed the ACA in conjunction with our audit	Review condition assessment process to ensure that the condition assessment does not skew the rating by averaging good and bad condition. E.g. ensure the current process isolates poor condition assets from the overall condition (Use of ADRs).

Test No.	Testing	Observations	Recommendations
		team. First the ADRs were reviewed to check if the work had been completed (which was the case evidenced by patching and coating of rust on the tank wall), then the condition of the asset reviewed. Discussions were undertaken on the ACA methodology and it was found to be in line with the manual.	
6.	**Review effectiveness of the assets themselves.**	Asset Performance is monitored at a number of levels Examples: • Very dynamic – Operations Centre; • Dashboards under continuous development; • Examples from SCM used for Capacity and Performance: o On-Line monitoring of critical assets Examples – Subiaco WWTP & Nicholson Rd; and o Where required by Maintenance Standards – examples Bores & Water Pump Stations. As detailed in the BPR Board/Exec Package July 2012 the asset performance indicator report includes: • Continuity - Properties not affected by interruptions > 1hr / (5.5 below target); • Water pressure and flow standards (0.2 below target); • Water quality faults responsiveness (0.5 above target);	Continue the development of dashboards as the need is identified.

Test No.	Testing	Observations	Recommendations
		• Installation of new water connections (2.1 above target); • Properties without Wastewater Overflow (0.1 below target); • Blockages per 100km of sewer (22.1 below target) • Leaks and Bursts per 100km of main (3.8 below target); • Country Water Allocation Licence Compliance (Qtly) (3.8 above target); • Drinking water quality E-coli, Amoebae:Naegleria>42C and Chemical Health Related all on target; • Number of environmental non-compliances reported by DEC (1 above target); and • Number of Environmental Sanctions (on target). As per the incident records, between 2009 and 2012 it is perceived that there has been a: • Decrease in sewerage overflows; and • An increase in water bursts and leaks.	
7.	**Test analysis of costs and actions to correct significant variation.**	Since the 2009 AMSER Audit – Unit Rate Tables have been developed for Planned Maintenance. Deviations from costs and actions are now reported: • Planned to Corrective monitored & made available for monthly Work Planning; • 2012/13 Activity Based Planning shows close	No Recommendations

Test No.	Testing	Observations	Recommendations
		alignment (4%) with best Practice; and • High effort put into cost analysis and budget control measures in 2011 & 2012. Principles of control and process/system changes agreed. Significant effort has been placed into targeted Regions e.g. G&A. This Region now has: • Well constructed and resourced Maintenance Plan; • Identified areas for expansion of contracting strategy; • Better targeted Pipe Banding Program; • Identified improvements that removed overlays of inspection activity (SSE) to release resources; and • Plan for greater completion rates for planned preventive and reduction of "Field Generated Planned Work". The maintenance costs are reported monthly at the region level as a part of the monthly business reporting and reported against budget costs. Should there be a significant variance, actions are undertaken to address it.	
8.	**Evaluate actions to investigate and correct issues including maintenance practices associated with asset failures during the review period.**	Depending on the severity of an incident, the incident reports provide significant detail on the incident; lesson learnt and associated actions to address the asset failures. Examples of actions include: • Chlorination Systems – High effort review of all systems resulted in:	No Recommendations

Test No.	Testing	Observations	Recommendations
		o Review of software configuration; o Application of new generation Maintenance Standard; o Introduction of Auto-shutdown testing and facility for test during maintenance; o Greater rigour in Work Order feedback on tests; o Revised Operational Instructions; • UV Systems – creation of new generation; • Maintenance Standard and Reliability engineering exercise on SWR Plants; • Chemical Bunds - Revision of maintenance procedure and SSE Work Instruction with emphasis on environmental alignment with the asset condition assessment; and • Aroona Alliance o Root cause analysis conducted on all significant equipment failures at Treatment Facilities. The incident management process alerts maintenance of deviation from intended performance. In the above instances the resulting actions appear technically sound and reasonable.	
9.	**Assess the use of risk/criticality to prioritise maintenance tasks.**	Current focus on Priority of Tasks in Maintenance Standards: • Priority numbering system is based on Corporate	No Recommendations

Test No.	Testing	Observations	Recommendations
		Risk Matrix; • Priority numbering 1-150 with "Regulatory" tasks given top priority. This was demonstrated in SAP planned maintenance; • New assets assessed during project planning as requiring Reliability engineering exercise for Maintenance. The criticality/level of service is assessed at this point. An example is the Armagh St PS; • Priority Numbering is used in financial year maintenance planning & risk/residual risk evaluation where the Asset Manager assesses and agrees risk with Risk Branch Manager; and • Execution of maintenance is then by priority and reported monthly for work planning meetings. The AM Branch is now working on a tool for assessment of (pre) elevated risk due to non-execution on task and determination of escalating risk.	
10.	**Test availability and knowledge of maintenance policy and strategy documentation**	The Maintenance Strategy is expressed in the maintenance standards and may be at facility level or equipment level. Access to the standards is provided through the Tactical Asset Management Web Page map. Training is provided to Senior Maintenance planners in the process & guidelines. Additional one-on-one training is provided using the "Maintenance Support Team" over 3 years.	No Recommendations

Test No.	Testing	Observations	Recommendations
		During visits to Woodman's Point WWTP, Aroona and the North West Region (Karratha and Port Hedland) personnel were tested on their understanding of the maintenance policy and strategy. The strategy is not a single document but a collection of separate maintenance strategies as defined in individual asset class plans supported by the maintenance standards. All personnel tested (Managers, Supervisors and Operators) were found to have a good understanding of the policy and standards including content, location (intranet) and intended use.	
11.	**Review any planned/preventative maintenance programs for completeness and test the application of these programs**	Scheduled maintenance was observed at Woodman's Point, Aroona and North West Region. Reports and access to the scheduled maintenance was available through SAP PM. The Alliance is also using a maintenance system developed previously for the creation, tracking and recording of work orders. This system was used beforehand and will continue to be used during the transition phase until the transition of IT systems is complete. Work order data is being updated to SAP on a daily basis to ensure the work orders are up to date. Additional reports are provided through the Alliance maintenance system. The SAP reports (sighted) clearly report on maintenance types (completed and active). The status of work orders is monitored and reported.	No Recommendations

Test No.	Testing	Observations	Recommendations
12.	**Sample scheduled maintenance in the AMIS and completion of associated work orders**	Scheduled maintenance is undertaken in the same manner as test 11 above. Maintenance is scheduled on a range of frequencies e.g. • Weekly; • Monthly; • 3, 6 Monthly; and • Yearly etc. Assets may also be scheduled by hours run.	No Recommendations
13.	**Test analysis of scheduled maintenance work orders completed on time**	The Work Planning & Scheduling Process & Plan Asset Maintenance Process requires a monthly review meeting with Asset Management/Service Delivery & Finance representatives. The maintenance performance & financial performance analysed at monthly meetings. A maintenance report pack is used at monthly review meetings. Guidelines on monthly analysis are available from a maintenance perspective. A standard report was sighted at the Aroona office for treatment plant maintenance. This was available through the SAP system. Similarly a report was viewed in Karratha for the North West Region. The report can be filtered on: • Customer Services Group;	No Recommendations

Test No.	Testing	Observations	Recommendations
		• Region; • District; • Mtce Plant; • Mtce Pl Group; • Cost Centre; • Cost Centre Description; • Priority; and • Sub Sub Program. In the period May 2011 to April 2012 for the 10 targeted asset classes across WaterCorp there were approximately 53,000 work orders compliant and 11,000 non compliant. Compliance refers to whether work is being carried out in full submission to the standards and requirements of general work instructions and is measured as completed orders.	
14.	**Review maintenance budget for identification of planned maintenance programs**	This test was undertaken at both Aroona and Port Hedland Office. In both cases the budgets were reported through the AMIS (SAP) against each maintenance program reporting the planned maintenance budget, actual and variance. In addition the budgets were also sighted during discussions with Finance at the higher levels. The comparative analysis report is provided in SAP.	No Recommendations
15.	**Assess recording and reporting of reactive work orders, type of failure and cause of failure**	A field in the work order is used to provide feedback and review of fault codes and cause. It is however a long text field making it extremely difficult to report against. It is used for adhoc fault analysis. Fault analysis is applied inconsistently	Formalise fault mode analysis and develop guidelines for data requirements and analysis.

Test No.	Testing	Observations	Recommendations
		across WaterCorp. In addition the completed work orders are not always completed with feedback being unclear. This differs between the Regions and the Alliance with the Alliance providing a higher level of feedback due to its history of maintenance system use and the maturity of the Alliance partners in this area.	Improve the quality of data being fed back into the work orders by providing documented direction and support for maintenance personnel.
16.	**Review the capture of maintenance costs on work orders**	Maintenance costs are captured against work orders in SAP. This was evidenced at Aroona (the Alliance), Woodman's Point and the North West Region. Maintenance costs are supported by the unit rates applied within maintenance standards which are used to form the basis of work orders. The costs are also tracked within the Finance system and reported against budgets.	No Recommendations
17.	**Assess the ability to report historical maintenance costs against the assets**	The SAP system has the ability to filter maintenance costs by a range of dates and can therefore report on historical maintenance. All historical costs are associated with functional locations in SAP and costs can be rolled-up to superior functional locations. In addition the Business Performance Reporting Framework provides the monthly and yearly costs at the higher levels e.g. facility/regions.	No Recommendations

Test No.	Testing	Observations	Recommendations
18.	**Test the ability to run reports from the AMIS for work orders outstanding, planned works not done, number of work orders raised against the asset types**	The SAP system has the ability to generate reports identified in this test. This was sighted at both Aroona and the North West Region. These reports are reported monthly.	No Recommendations
19.	**Review the information feedback loop after works are completed and asset information requires updating**	For information on the feedback loop refer to test no. 15 above. In summary the required data is not always provided or consistently applied. Similarly, there is a significant gap in asset attributes within the equipment register of SAP. This has meant data that is needed for asset renewal planning is not available e.g. year installed. A process was available and monitored during the last review to ensure the attribute data was captured. This process was later abandoned. The asset handover process will improve data capture for new assets if applied correctly but will not improve the situation for existing assets. In recognition of data integrity issues WaterCorp is embarking on the development of a corporate wide strategy to improve the quality of the data.	Incorporate the data capture as part of planned maintenance and/or inspections as part of normal operations.
20.	**Test analysis of cost tracking and trending e.g. reactive verses proactive maintenance**	The tracking and trending of costs is provided through the following for work orders: • Maintenance Reports; • Activity Based Planning Reports; and • Reports utilised at monthly Work Planning Meeting.	No Recommendations

Test No.	Testing	Observations	Recommendations
		The performance of the maintenance is monitored by the Region Manager and reported through the Service Delivery Branch. The information is also used by the Asset Management Branch to monitor maintenance performance.	
21.	**Assess the adequacy of maintenance policies and procedures**	Maintenance is supported by the following documents: • Maintenance Policy; • Maintenance Standards; • Maintenance Plans; and • General Work Instructions. These documents in turn are supported by: • Process and Guidelines; • The Maintenance Story; • Guidelines on monthly analysis; • Accountability Framework; • Incident Management policy and guidelines; and • Extensive reporting. All document types have been sighted and are available through the intranet. The documentation is extensive and appropriate and provides the basis for undertaking, recording and reporting of maintenance.	No Recommendations
22.	**During the site visits, physically inspect a sample of assets to assess the asset condition against the last condition inspection of the asset**	As part of this review the following sites were visited: • Karratha SPS #2, Balmoral Road; and • Karratha tank #3 (25 ML).	No Recommendations

Test No.	Testing	Observations	Recommendations
		The tank structure was in good condition with evidence of minor works undertaken previously with some removal of rust and protective coating applied to the structure. ADRs had been raised previously to address this issue. The main issue was build-up of corrosion on the valves in the pipework and valve assembly area. The ladder was in a reasonable condition. The pump station was found to be in a good condition despite the age of the switchboard used. In reviewing the past asset condition assessments (2007/08) against these sites, while there were some minor changes, the current condition observed conformed to the previous condition results. It should be noted however, that the inspections undertaken by the reviewer were limited to ground level. The internal components of the tank could not be accessed. The asset condition assessment shows that the past condition was a rating 4. Work order history indicates cathodic protection capital works have been undertaken to address corrosion.	
23.	**During the site visits, physically inspect a sample of assets and review the adequacy of the asset's maintenance records and effectiveness of the asset maintenance undertaken during the review period**	Assets were inspected at Newman. Hydrants installed by BHP prior to handover to WaterCorp are American above ground hydrants. They are now exhibiting rusting failure where the riser meets the ground level. They are being replaced with standard hydrants as they fail. Inspections were being performed on the sewer manholes at	Repeat failures should be monitored and reported centrally. Should repeat failures demonstrate an ongoing trend, strategies should be developed to

Test No.	Testing	Observations	Recommendations
		the time of the visit. Inspection of the lids indicated a number of lids popping as a result of gas build up in the mains. The concrete in the lids was either cracking or breaking up as a result of upward pressures. It should be noted that review of the manhole lids indicated they had not be opened for a significant length of time (years). The Woodman's Point Wastewater Treatment Plan in Perth was inspected during the review process. The assets appeared to be in good condition. It was obvious that maintenance was being undertaken on a regular basis. Inspection of the SAP system indicated this was the case by the record of work orders scheduled, responded to and completed.	overcome the trends.

Documents sighted

- Corrective vs Preventative Maintenance 12 months
- PM-#943077-v8-Disinfection systems, January 2009
- Doc ID 1366665, Electrical mech civil-generic work instruction register
- EMS Report - Wastewater Pump Stations & Pressure Mains (SP) and Wastewater
- G&A report, December 2012
- GSR report, December 2012
- Doc ID 825046, Maintenance standards and continuous improvement register
- Monthly report chlorine
- Monthly report example

- MWR report
- NWR report
- Doc ID 789957, Our Maintenance Story, December 2011
- Doc ID 4126906, pcy341-asset maintenance, November 2010
- PM-#3844201-V3-Plan Asset Maintenance Process and Guidelines
- Planned Preventive Maintenance Performance - 10 Asset Classes - 12 Months to April 2012(1)
- PM-#6827688-v1-Top 10 Tasks (With Order Type) - 12 months to April 2012
- PM-#7175463-v1-EMS Report - Wastewater Pumping and Reticulation - 12 Months to June 2012
- PM-#7387870-v1-AMSER Audit 2012 Maintenance Session, 2012
- PM-#7430811-v1-EP PM04 completion 2011 12.XLS
- WP PM04 completion 2011 12.XLS
- PR Report
- RCSG Report
- Riverside Monthly Report, June 2007
- Riverwise Example for Audit, June 2007
- Doc ID 5399350, SAP PM Chlorination Fault Tasks, August 2012
- PM-#825650-Standard Reports, June 2008
- PM-#4216636/2-TAM Process Measures and Data, February 2011

7. Asset Management Information Systems

Key Process	Outcomes	Effectiveness Criteria
An asset management information system is a combination of processes, data and software that support the asset management functions.	The asset management information system provides authorised, complete and accurate information for the day-to-date running of the asset management system. The focus of the review is the accuracy of performance information used by the licensee to monitor and report on service standards.	• Adequate system documentation for users and IT operators • Input controls include appropriate verification and validation of data entered into the system • Logical security access controls appear adequate, such as passwords • Physical security access controls appear adequate • Data backup procedures appear adequate • Key computations related to licensee performance reporting are materially accurate • Management reports appear adequate for the licensee to monitor licence obligations

Test No.	Testing	Observations	Recommendations
1	**Identification and inspection of process documentation covering control and security of information systems.**	There is significant documentation covering all systems used by WaterCorp. It comes in the form of: • Policies e.g. PCY237 Information Management, PCY268 Accountability Framework, PCY149 Intellectual Property, PCY252 Privacy, PCY315 Business Continuity Management, PCY328 Corporate Learning and Development; • Information Standards e.g. S055 Security Roles and Responsibilities, S056 – Asset Management, S057 – Business Continuity, S058 – Security Technology	No Recommendations

Test No.	Testing	Observations	Recommendations
		and Physical Security, 059 – System Access Control; • ICT BCP Documentation Framework (DRAFT); • Application User Manuals; • Application Technical Manuals; and • Quick reference documentation on the WaterNet. S052 Information Usage – general usage controls is currently under review. All policies are stored in CorDocs.	
2	**Random testing of user's with respect to knowledge of system and data management procedures.**	Informal testing was undertaken on personnel in the corporate office and NW region with respect to the knowledge of systems and associated procedures. All personnel demonstrated sound knowledge in the use of the systems they use. In addition they also demonstrated awareness of other systems that either support or provide information for their needs. Personnel tested included the following: • Infrastructure Planners; • Operations Managers; • Asset Management Managers; and • Maintenance Planners. The findings of the testing concluded: • The understanding of personnel with the systems they used varied across the business from intimate knowledge to general understanding. However there was no evidence of users not understanding	No Recommendations

Test No.	Testing	Observations	Recommendations
		the systems they used; • The systems form part of day to day activity and this is accepted by personnel; • Personnel within the AM branch are aware of the need for sound data to support their functions. There is a need in the NW region to improve the education supporting personnel (general workforce) in system use and data needs who are responsible for collecting the data required for reporting purposes; • The systems used are supported to some degree by in-built data controls e.g. drop down lists, data validation; • There is a high satisfaction level with users and this is associated with high use of the systems; and • Data management is not specifically identified within the accountability framework Water Corporation has entered a contractual agreement with GE Smallworld for the joint development of their Water Office suite of GIS products. The increased functionality of this product will be sequentially implemented over the next few years. Measle maps are now available for pipe repairs on reports generated from the mobile computing system and are delivered to regions monthly. Registration of assets involves: • Approval of scope and request FLER at facility level;	

Test No.	Testing	Observations	Recommendations
		• Propose structure and notify stakeholders; • Receive feedback from stakeholders; and • Setup hierarchy with attributes etc. in line with data management procedures in asset handover guideline and asset details guideline. Monthly audits of FLER hierarchies created via the above process are undertaken.	
3	**Review of the accuracy of performance data sets and reporting.**	Performance reporting is an extensive activity across WaterCorp. The frequency of performance reporting varies across the business from weekly in the case of operations to monthly for AM branch to quarterly and annually for Executive reporting. This places a high demand on personnel to collect and analyse the results of the reporting as well as communicate the results and recommendations for any variances. This is also a driver to ensure the right systems are in place to allow the reporting to be timely supported by the required data. The Business Process Review System has been developed to assist in structuring the reports with the appropriate structure and data needs. It also requires close off of the data at specific times to allow the results to be aggregated against the reporting hierarchy. The use of the traffic light system (red, yellow, green) to identify non-compliance with KPI levels allows for easy identification and assessment of issues resulting in focussed analysis of poor performance.	No Recommendations

Test No.	Testing	Observations	Recommendations
		Business warehouse dashboards are under continuous development which allow the user to view reports on all compliance driven performance information such as sewer blockages/overflows and bursts. Capacity and performance reporting is also undertaken through the SCM. Example reports sighted were: • Borefield Cane – Volume Abstracted from Borefield (Master Meter) – Monthly; • Borefield Cane – Volume Abstracted from Borefield (Master Meter) – Annual; • Town Services vs Consumption – Onslow; • Consumption vs Production – Onslow; • Forecast Average Day Peak Week (ADPW) – Onslow; and • Service Growth – Onslow. An asset managers dashboard is planned (currently proof of concept) that will allow the asset manager to view the common reports in a dashboard view for quick access to the performance information important to them. The type of reports that may feature in this dashboard are: • Wastewater blockages; • % work orders completed; • % work orders completed on time; • Highest number of faults and type of faults. For operations, the dashboard may contain a planning status	

Test No.	Testing	Observations	Recommendations
		and actual vs budget costings. Woodman Point WWTP tracks the following BPR's: • % of Regulatory samples taken; and • % of Operational samples taken. Exclusions are explained e.g. bores are dry, effluent sampling points are dry. Financial reports consist of: • Macro budgets in September each year; and • Micro budgets in May each year. All KPI's for the Waste Water Treatment Branch are contained in the BPR Performance Score Card June 2012.	
4	**Random sample of management reports available to satisfy management needs and actions to address significant exceptions.**	Performance reporting is undertaken within a structured hierarchy e.g. region, branch, executive, board and external e.g. ERA and involves operations, maintenance, condition, risk, project delivery, capital expenditure and many other activities. This provides personnel with the ability to drill down through the reporting to determine at the micro level the items that are causing performance issues. As discussed previously any non-compliance or adverse trends are identified and actions put in place to rectify the issue. These rectifications vary between the performance criteria but may involve the following processes:	No Recommendations

Test No.	Testing	Observations	Recommendations
		• Changes to operational plans; • Changes to maintenance activities; • Further investigation; • Additional capital expenditure; and • Ongoing additional monitoring. Where required, actions will be escalated to the required Branch for comment, analysis, recommendations and resolution.	
5	**Assess the data backup procedures for adequacy.**	'S103 – Standard Operating Environment – Workgroup Server Backup and Recovery' describes a minimum set of rules governing the backup of Water Corporation data, the storage of those backups and the mechanism to recover backups to comply with the Information Management Policy principle in relation to Data Management. The backup process occurs nightly and tapes of the backups are kept on site for 3 days. SCADA backup occurs nightly across multiple servers and tapes are held onsite for 3 days and off-site for 6 months. Disaster recovery tests are undertaken. Communication and dual power supply has in build backup: • Access from 2 exchanges; • Backbone and firewalls in place; and • UPS and gensets in place in case of power failure. Gensets and UPS are tested 6 monthly by a contractor. Auto	No Recommendations

Test No.	Testing	Observations	Recommendations
		start is available on all 3 generator sets. This testing process is supported by procedures: The following support actions are completed: • 2-3 times a year the Corporation tests the backup tapes. • Virus definition deltas are received daily. • Cloud service filters for spam/viruses etc.	

Documents sighted

- Business Performance Reporting Board/Executive Pack, October 2011/12
- Weekly Operations Report, 30 September 2009 (Subiaco, Beenyup, Woodman Point, Kwinana WWTP)
- PM-#556032-v2-PCY237 Information Management Policy, November 2007
- PM-#867740-v1-Southern Seawater Desalination Project IWSS Integration User Requirements Superseded by 1100079, June 2008
- Corporate SCADA Strategy, December 2011
- PCY267 - Creation and Support of SCADA Systems - 15 November 2011, February 2012
- Doc ID 1138415, PCY315 Business Continuity Management, April 2012
- Doc ID 1991393PCY328 Corporate Learning and Development, September 2011
- Doc ID 400838, s055-Information Systems-Security Roles and Responsibilities, May 2010
- Doc ID 400839, s056-Information Systems-Management Asset Management, May 2010
- Doc ID 400840, s057-Information Systems-Security Business Continuity-IT Disaster Recovery, May 2010
- Doc ID 400841, s058-Information Systems Security-Security Technology and Physical Security, May 2008
- Doc ID 400842, s059-Information Systems Security-System Access Control, February 2011
- Doc ID 368565.V2.1, SCADA Infrastructure Plan, January 2006
- SCADA key document relationships, April 2012
- PM-#4619204-SCADA System Asset Class Plan - Published Version 1, March 2011

- SIBC OIC SCADA, May 2011
- PM-#7416396-v1-AMSER Audit - Asset Data Strategy
- PM-#5540265-v2-Data Standards - SCF View
- PM-#7416107-v1-AIS Strategy - webpage
- PM-#7572690-v1-BPR – Wastewater Treatment Performance Scorecard, July 2012
- Doc ID 404111, Accountabilities PCY 268, November 2011
- PM # 1147064.v1F - ICT BCT Framework, July 2009
- Doc ID 364943, Intellectual Property PCY 149, February 2009
- PM # 1157167.v1K - ICT Incident Management Guidelines, June 2009
- Privacy Policy PCY 252, July 2007
- Doc ID 1960062, S103 Workgroup Server Backup and Recovery, April 2009
- Water Corp Final Board Pack June 2012, July 2012
- Doc ID 589729, Asset Handover Guideline, August 2008

8. Risk Management

Key Process	Outcomes	Effectiveness Criteria
Risk management involves the identification of risks and their management within an acceptable level of risk.	An effective risk management framework is applied to manage risks related to the maintenance of service standards	• Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system • Risks are documented in a risk register and treatment plans are actioned and monitored • The probability and consequences of asset failure are regularly assessed

Test No.	Testing	Observations	Recommendations
1	**Identification and inspection of policies and procedures.**	One of WaterCorp's main objectives is the reduction of risk across the business whether it be asset failures, financial risk and others. The supporting documents (policies and procedures) include: • ISO 31000; • PCY135 Risk Management; • Risk Management Guidelines; • Business Continuity Management Policy; • Business Continuity Management Guidelines; • Accountability Framework; • Guideline for Plan and Assess and Monitor Asset Performance and Condition and Risk Core Process; • Risk Assessment Criteria;	Improve the process documentation supporting ARA such as guidelines with examples, criteria matrix, links to planning process etc.

Test No.	Testing	Observations	Recommendations
		• Corporate Risk Report; and • Manage Risks Process. In addition the SRA and ARA have the following documentation that was sighted: • System Risk Assessment – SRA – User Manual; • PM-#2974514-v29-ARA Business Rules; and • ARA Session 2 – Proposed Options.	
2	**View the risk register, select samples and review treatment plans that have been actioned and monitored.**	All risks that are deemed unacceptable / undesirable have a risk mitigation plan or a risk acceptance decision. This information is maintained in the AQUA excel spread sheets but is not always uploaded into Corporate Risk Information System (CRIS). Some areas of the business choose to manage their risk mitigations at a local level and not use CRIS. With the new system in place risk mitigations will be maintained in the new system. CRIS is the Corporations current risk register however the purchase of a new risk system is currently up for tender. The Corporation is looking for more from its risk register. In parallel to the update of CRIS a review of the current 'risk criteria' is occurring which focuses on improving the financial aspects of the current criteria. The replacement for CRIS will improve WaterCorp's ability to locate all the key risk mitigation plans more promptly but currently this information does exist. DWQ risks are incorporated into CRIS – this information is	On procuring the new Risk Information System (register) and in accordance with the risk management principles, existing and new corporate risk be consolidated into the new system.

Test No.	Testing	Observations	Recommendations
		currently available on CRIS and the AQUA document will refer to the risk mitigations in place. CRIS was demonstrated and random risks were nominated. An assessment of the treatment plans for sample assets was undertaken. The treatment plans are linked to the asset risks in CRIS. Not all treatment plans were available against high and extreme assets. For example water quality assets are contained within a separate risk register and therefore the treatment plans were not evident. Separate risk profiles (spreadsheets) are available for level 2 processes as portrayed on the accountabilities framework. 3 were inspected: • OSH; • Wastewater Process; and • Strategic Risk. The risk profile treatment plans contain the following: • Corporate Position and/or Risk Management Objective; • Tasks and Actions; • Deliverable Dates; and • Task/Action Owner. Out of the 3 profiles the OSH and Wastewater process profiles identified risk treatments. The strategic risk although extreme risks were identified did not contain treatment plans. These treatment plans are documented in	

Test No.	Testing	Observations	Recommendations
		the Corporate Risk Report together with location of funding and positions responsible for mitigation the risks.	
3	**Examine risk register to check if potential failures have been identified in the register. Review asset failures and failure rate. Has the risk rating been reviewed after the failure?**	Failures are recorded in the incident management system (IMS) to hold a record of the incidents that occur including the failure of assets. For example, after inspecting the incident management system failure records it appears that: • Sewer overflows are decreasing; and • Bursts and leaks are increasing. The asset risk rating against the assets is stored in ARA and system level risks are stored in SRA. Once the asset failure has been identified and appropriate investigation carried out, a risk review in ARA should be undertaken. Provision for this is catered for within the ARA system. It is not apparent if the risk ratings are reviewed immediately after the failures were identified in the IMS. Asset risks are reviewed after a capital project has been completed. This has been happening on a 6 monthly basis by the Capability Team however with recent efforts to improve this process the Corporation has made it mandatory as part of the handover process to review the risks. It has been advised that this change in process has been included in the handover guidelines. As ARA is not currently being used in the regions e.g. NW	When a failure is recorded and subsequently completed the risk review should be undertaken as part of the incident process and identified on the incident form e.g. who reviewed the risk, when it was reviewed and what the outcomes were.

Test No.	Testing	Observations	Recommendations
		Region it is unlikely that any asset risks have been reviewed after an asset failure has occurred. At the high level through the performance business reporting the failure records are reviewed and frequency of failure is reported. It is essential that processes are in place to keep risk data as up-to-date as possible.	
4	**Check that the risks associated with assets that have been treated, have been reviewed. Check whether the risk review has been recorded.**	Refer previous test. It is difficult to test whether the risk review has been undertaken and recorded as part of the newly defined process. There has been insufficient time between updating of the handover guidelines and implementation to obtain an accurate demonstration of this test. On inspection of the ARA risk register, changes to assets are reflected by the residual risk becoming the current risk and the assessment review due date being changed.	No Recommendations
5	**Random inquiry of staff as to their knowledge of the risk process.**	Random inquiry of WaterCorp personnel with respect to their knowledge of risk at a Corporate level was adequate. Knowledge of system and risk processes was evident. Knowledge of system risk assessment (SRA) at regional level was very conversant. System and supporting documentation was readily available. Demonstration of documentation was undertaken. Use of ARA was *not* evident in the region to the extent that	Advise the regions on the benefits of ARA and how they can help the organisation achieve business objectives. Align NW Regions approach to the use of the Corporate System (ARA).

Test No.	Testing	Observations	Recommendations
		NW region was using its own spreadsheet to manage contingencies should failures occur and informally prioritising the works resulting from these failures. Although using a similar concept to the ARA, the contingency spreadsheet is not part of the corporate system. Use of risk to support decisions was not evident although risk concepts are used in theory. Supporting documentation was not available.	
6	**Review the application of risk by personnel.**	Risk within WaterCorp is employed in many ways; • Corporate Risk (Risk Profiles); • System Risk Assessment (SRA); and • Asset Risk Assessment (ARA). **Risk Profiles:** Accountable persons are required to undertake the following key activities: • Develop a risk profile for their area of responsibility within the corporate context; • Analyse the risks using the Corporate Risk Assessment Criteria; • Develop and action risk mitigation (treatment) plans; • On-going monitoring of the Risk Profile to ensure risks are managed to an acceptable level; • Review profiles to reflect changes in the environment;	Improve the application of ARA in the regions.

Test No.	Testing	Observations	Recommendations
		• Ensure clear audit trail of decisions; • Use risk information in strategic and business planning process.; and • Report on the status of risks and mitigation plans in accordance with risk management reporting protocol. As an example, the Strategic Risk Profile is produced through the corporate risk register. The Strategic Risk Profile provides the Board and Executive with a graphical representation of the corporate risks within the risk register. Corporate risks are identified against key elements e.g. • Customer; • Recruitment; • Economic; • Environment; • Stakeholder/Political; • Regulation/Governance; and • Societal. Consequences including financial are analysed and reported within the register. Actions are then generated to address the high and extreme risks. Consolidation of the Corporate risk profiles come together as part of the Corporate Risk Report which considers all Corporate risks for the business. This report is generated annually. **SRA – System Risk Assessment:** Summary risk information is	

Test No.	Testing	Observations	Recommendations
		contained within the System Capability Matrix. The SRA tool is used to assess risk at a system (town) level, e.g. Broome Water Supply Scheme. SRA is used as a tool in many of the following activities: • Used as the main base data for the System Capability Matrix (SCM); • Helps determine the level of risk and management of that risk in corporate infrastructure assets by both asset and operational employees; • Used in reports generated from SCM for various Corporate Governance and Management Committees; • Assists in the prioritising of planning requirements for IPB; and • Assists in the prioritising of projects in the Capital Works Program. The SRA is applied when: • The risk is associated with an asset system (e.g. a Scheme for a country town); • The risk is associated with a demand / capacity issue; and • The risk is associated with a water quality issue related to a source or asset system. The use of SRA is supported by the System Risk Assessment – User Manual'. Application of SRA in the North West Region was strong.	

Test No.	Testing	Observations	Recommendations
		ARA – Asset Risk Assessment: The future of the ARA is being considered. For example: • Where should the tool be stored and from what system should it be accessed (e.g. SCM); • Use of the tool by the regions; and • Integration with contingency planning. The power point 'ARA Session 2' considers the future application of ARA. The ARA applies when: • The risk is associated with a single site level asset (e.g. Water Storage Complex or WPS); • The risk is associated with the need for asset renewal; and • The risk is associated with a water quality / contamination issue related to asset condition. The 'Process Overview and Business Rules' document supports ARA. Application of ARA in the North West Region was not evident. The Asset Management Branch recognises the need to improve awareness, training and use of ARA within the regions.	
7	**Test availability and knowledge**	Knowledge of the risk framework was tested in both the	Embed ARA within the organisation by making it more

Test No.	Testing	Observations	Recommendations
	of risk framework documentation	central office and North West Region. Risk framework documentation is readily available through the intranet. Risk policy, guidelines, process charts, consequence criteria definitions etc. are available to those who need them. Documentation on both SRA and ARA are available through the relevant dedicated pages. Guidelines are available to build understanding and assist in carrying out the assessments. SRA appears to be well embedded in the organisation.	user friendly and improving education.
8	**Assess the availability of a risk management manual or equivalent that provides the instructions for the application of risk criteria and supporting processes**	Corporate risk is supported by: • Risk Management Guidelines; and • Risk Assessment Criteria. SRA is supported by: • Consequence Table Master; and • System Risk Assessment – User Manual. ARA is not yet supported by a clearly defined and documented criteria however the 'Process overview and business rules 2011' document brings the concepts and business rules of ARA together. The Corporation intends to develop a guideline document on asset risk assessments with good examples to support its application.	Refer Test No. 1 above.

Test No.	Testing	Observations	Recommendations
9	**Review the use of criticality and condition assessment information in the risk management process**	Criticality also known as Consequence of Failure is used within the Corporate risk management framework as per the 'Risk Assessment Criteria'. The consequence table within the document is used to calculate the impact level to the business should the perceived risk occur. SRA uses criticality to determine the consequence of failure for all system based risks. SRA is used for many purposes through the business as explained in Test No. 6. ARA is primarily used by the Asset Renewals team. The use of ARA in renewal planning firstly involves a desktop risk assessment of the assets. This desktop assessment involves the determination of the consequence of failure (criticality) and likelihood of failure. When ACA information becomes available the likelihood component of the desktop risk assessment is updated and a new risk score is calculated based on current asset condition. This risk is used to prioritise the renewal projects.	No Recommendations
10	**Review the prioritisation of works based on risk**	The Corporate risk profiles identify risks and risk levels prioritise projects at the Corporate level. The Capital Prioritisation System (CPS) lists all projects required based on risk. These priority projects formulate the 5 year plan. SRA prioritises projects required at a system level. ARA is intended to prioritise projects required at an asset level. The CCTV program for reticulation sewers is prioritised by	No Recommendations

Test No.	Testing	Observations	Recommendations
		criticality. The Corporation is currently seeking a tool to undertake that assessment using the current assessment criterion 'Consequence Factors for Sewer. Risk of project options is utilised as part of the SIBC process. The consequence of not spending the optimal amount of renewal is considered. Financial and environmental factors are measured. The treatment register reports on ADR's received across the State: • Each ADR suggests a treatment coupled with a risk assessment; • The ADR's are prioritised based on the risk ratings; • Issues are kept alive in the system until treated; • If treatment chosen is an opex option, treatment can be undertaken through the work order system; and • If treatment chosen is a capital option personnel must prepare an online appropriation request. The Aroona Alliance is currently identifying critical assets for treatment plants by capability group. 4 parameters are considered as part of the criticality assessment: • Reliability; • Capacity; • Quality; and • Cost (operations/maintenance).	

Test No.	Testing	Observations	Recommendations
		The above is documented in the criticality document; "Aroona Alliance Management Plan - Asset Management"	
11	**Review the availability and use of JSA's and other OH&S checklists. Test the completion and recording of such checklists.**	The availability of JSA's and OSH checklists was examined in the North West Region. From discussions and sighting examples it was deemed that the checklists are used on an ongoing basis. For more details Refer Operations Test No. 10.	No Recommendations
12	**Test that water quality risks have been identified and controls are in place to mitigate risks e.g. blue green algae or equipment failure**	It was indicated that the water quality risks have been identified and evidence of this was supplied. The water quality risks are recorded in a spreadsheet and evidence of a control effectiveness rating is included.	On procuring the new Risk Information System (register) incorporate Water Quality risks into the system
13	**Review the identification of failure modes by asset type**	The identification of failure modes occurs as part of work order completion. Within the work order a field exists for incorporating asset failure. Of the work order reports sighted at the North West Region only a handful of work orders contained an appropriate entry for failure mode/cause. This highlights an issue for both the regions and the planners when there is high reliance on accurate, consistent and complete data in order to develop sound asset strategies.	Establish codes for failure mode input into work orders and make it mandatory to be completed.
14	**Examine whether the consequences of asset failure are regularly assessed**	The consequence of asset failure is currently assessed in an adhoc manner. The full implementation of ARA will formalise the use and assessment of consequence of failure. Currently some processes are assessing consequence of failure as a	Implement a consistent approach to the identification of consequences of asset failure across WaterCorp.

Test No.	Testing	Observations	Recommendations
		means of assessing project risk and/or prioritising projects.	
15	**Sample a number of asset failures. Determine if root-cause analysis has been completed and what has been done as a result of the analysis.**	<u>Faulty Butterfly Valve on Woodman Point Effluent System</u>: 'Valve Incident Memo November 2011': At approximately midnight on Saturday 3 September 2011 a failure of the 1200mm butterfly valve on the balancing dam gravity pipe resulted in a high water level in the dam. The valve needs to close to enable large pump operations. Preliminary and later detailed investigations, that included removal and testing of the drive gearbox and motor, concluded that there was an internal failure of the valve. A root cause analysis is detailed in 'Investigation Into The Failure of Balancing Storage Dam Gravity Bypass Line Control Valve Ev-61611'. The selected repair method involved the removal of the failed valve and the installation of temporary dead plates which would allow resumption of normal effluent pumping capacity. In order to limit the release of secondary treated wastewater to the Cockburn Sound contingency outlet during repair work the higher cost option was selected. This involved the fabrication and installation of a heavy duty steel frame and stoplog which would allow emptying of the balancing dam and hence a safe work environment for welders in a 7 metre deep pit. Supporting the above incident, analysis information for emptying the dam is contained in this document 'Woodman Point WWTP - Balancing dam information Sept 11'. A presentation providing details of the incident is also available 'Woodman Point Valve	Re-visit the recommendation from the AMSER 2009 audit and review incident reports to ensure cause of incident, links/references to the root cause analysis document and the date completed are recorded. Develop consistency of approach to data entry by incorporating standard codes for incidents so that reporting can be structured. Enhance the E2E process for incident management that addresses incidents that create different levels of impact. Develop triggers within the incident management system in line with a decision tree to identify and monitor future actions to address the incident raised.

Test No.	Testing	Observations	Recommendations
		Incident Presentation to WW Governance Committee Dec 11'. <u>Woodman Point Primary Sedimentation Tanks</u> Woodman Point primary sedimentation tanks failed October 2010. An incident report was logged – incident record #4065. The incident classification was significant. The following aspects were recorded: • Date of Incident: • Site Location; • Business Area; • Incident Description; • Extent of impact; • Potential; • Personnel Informed; • Prognosis/Response; • Registered by and date of registration; and • Comments made included – Root Cause Analysis was carried out with actions implemented. The cause of the incident was not reported on the incident form. An RCA report for this failure has been sighted named 'Woodman Point Waste Water Treatment Plant Primary Sedimentation Tanks Root Cause Analysis, October – November 2010'. This report details the status of actions as at 15/02/2011. In 2010, the completion of the root cause analysis field was made compulsory within the Incident Management System. On inspection of the incident record #4065 it was identified that the cause of the incident was not reported on the incident form.	Review the data quality within the incident management system to address the supporting processes, data and the effectiveness of the system. WaterCorp needs to complete the investigation on the Jabbarup main failure and identify future actions as required. A formal criticality assessment be applied across the corporation to improve the prioritisation of assets and associated works. Develop and implement a strategy to ensure multiple or repeat faults or fixes for the same address or asset are highlighted and investigated.

Test No.	Testing	Observations	Recommendations
		Instead a comment referenced the RCA. On further review of the incident records we have identified the following: • Incident report numbers missing; • Functional location missing; • Asset field not completed; • Incident reportable field not completed; and • While noted in comments RCA was performed there is no link to RCA. Consideration needs to be given to the effectiveness of the IMS training courses undertaken to improve on the 2009 audit recommendation. <u>Jabbarup Crescent, Newman</u> The failure of the 200 mm water main in Jabbarup Crescent, Newman between January and April, 2012 resulted in damage to the road and residence. The failure resulted in the residence becoming unlivable. A 90 degree bend blew out at the end of the road which was then repaired on a number of occasions. The final repair; replacing the 90 degree bend with two 45 degree bends relocated to different sides of the road has resulted in no further failures since May. However, the failure resulted in subsidence of the house and the swimming pool. We have been told verbally that the house is still subsiding into the underground cavern allegedly created by the main failure.	

Test No.	Testing	Observations	Recommendations
		While in the region, we reviewed the work orders associated with this failure and found 4 work orders raised. Two of the work orders were for $35,210.14 and $27,327.76 respectively. The work orders do not however detail the extent of the failure and repairs. It was also expected that an RCA analysis or investigation would have been undertaken by Corporate. We believe that there has not been a full investigation into the failure as we have seen no evidence to suggest that a subsequent report or review of the main and surrounding environment was undertaken. There is no evidence of an RCA analysis either. This leaves WaterCorp open to a potential risk to further failure and/or damage from the initial failure. <u>Roger's Way Newman</u> The PVC water main runs along Roger's Way outside the Primary School and under a row of mature trees. At the time of failure valves had to be installed to isolate the main. But the main could not be repaired for a few weeks after the failure. The failure occurred during school holidays negating the need to shut the school due to lack of water. Concern has been expressed by WaterCorp personnel that the main could fail at any time due to the mature trees. The main is being assessed for realignment away from the trees. The main is in a critical area between the school and shopping complex. A formal criticality assessment has not been developed. If it had been then the main may have been identified earlier for	

Test No.	Testing	Observations	Recommendations
		re-alignment. In addition to the above, Root Cause Analysis is undertaken by the Aroona Alliance. A desktop analysis is completed initially driven by the results of the MEA software e.g. cost of jobs, hours on jobs and function location jobs. A more formal RCA maybe undertaken depending on the initial findings. In this case a maintenance report is produced and emailed to the responsible person. The report is then followed up based on the issues.	

Documents sighted

- PM-#699610-v3-PCY135 Risk Management Policy, April 2012
- PM-#625204-v3-Risk Management Guidelines, September 2010
- PM-#621047-v4A-S389 Risk Assessment Criteria, August 2009
- SRP 2009 Strategic Risk Profile
- PM-#3033115-v4-Asset Damage Risk Assessment Procedure, June 2010
- PM-#852589.v3-Consequence Table Master
- List - Critical Assets & Pinch Points & SCF - All Assets
- Doc ID 2675129, System Risk Assessment - SRA - User Manual, February 2011
- PM-#6686700.v2 - System Capability Forecasting Application - SCF - Presentation, Growth/Capacity Monitoring and Reporting
- PM-#2882847-v3C-TRP Manage Wastewater Process Risk Profile
- PM-#5492700-v1-2011 12 WWTB risk control report, July 2011
- PM-#2882847-v3C-TRP Manage Wastewater Process Risk Profile
- PM-#5492700-v1-2011 12 WWTB risk control report
- PM-#6816057-v1-Critical Assets & Pinch Points & SCF - All asset list
- PM-#7402923-v1-Wastewater System Capacity Presentation for Risk Management Committee August 2012
- Doc ID 3571033, System Capability Matrix - SCM - User Manual, September 2011

- Doc ID 5754454, User Manual - System Capability Forecasting, April 2012
- PM-#5685593-v8D-Corporate OSH Risk Profile
- PM-#7146265-v2-2012 Corporate Risk Report FINAL, June 2012
- PM-#2974514-v29-ARA Business Rules, July 2010
- PM-#7140764-v1-ARA Session 2
- PM-#7571071-v1-Consequence factors for sewer DST
- Doc ID 4351658, Admin Manual - System Capability Matrix, March 2011
- Doc ID 3571033, System Capability Matrix - SCM - User Manual, September 2011
- Doc ID 5754454, User Manual - System Capability Forecasting, April 2012
- Accountabilities Framework
- Doc ID 1138415, PCY315 Business Continuity Management, April 2012
- PM-#3528562-v1-Business Continuity Management - BCM - Guidelines, June 2010

9. CONTINGENCY PLANNING

Key Process	Outcomes	Effectiveness Criteria
Contingency plans document the steps to deal with the unexpected failure of an asset.	Contingency plans have been developed and tested to minimise any significant disruptions to service standards.	• Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks

Item No.	Testing	Observations	Recommendations
1.	**Identify contingency plans and their review processes.**	Contingency planning is supported by the Contingency Planning Guidelines. The purpose of this document is to provide guidance on the development of contingency plans and establish a standardised approach to contingency planning for all aspects of the Water Corporation's operations. The document is in draft format and should be completed. Generic contingency plan templates have been developed for Water Treatment Plant, Water Pumping Stations, Sewerage Treatment Plant, Sewerage Pumping Stations, Chemical Dosing Plant, Sewer Gravity Mains, Sewerage Pumping Mains, Water Mains, and Water Storage Complex's. Contingency plans are either based on safety e.g. Cl_2 gas	Finalise the draft contingency planning guidelines.

Item No.	Testing	Observations	Recommendations
		or event based e.g. cyclone, bushfires. More recently operational contingency plans have been produced in the North West Region and are in draft format. These plans have been produced for Onslow, East Pilbara and Hedland. The next phase of the process for these plans is to review them from the point of understanding how implementable are the plans looking at the appetite for risk and affordability. From this process a priority list will be developed for other sites within the North West Region. Each region has an officer responsible for the creation or review of contingency plans. Simple event based plans are reviewed as part of the debriefing process resulting from a major failure. From this debriefing, associated changes to the plan are recommended. Plans are generally updated in CorDocs on a 3 yearly review (Sighted). Contingency plans are updated as issues are found for safety related plans. Records of changes to the plans are recorded in the document revision history. In addition to the above process the incident management system is a trigger for either creating contingency plans or updating contingency plans.	

Item No.	Testing	Observations	Recommendations
		Depending on the incident an action may be to review the contingency plan.	
2.	**Do a walkthrough of contingency plans (Desktop and exercises) and check for compliance. Explore the frequency of updates.**	While in the North West Region the Cl_2 gas contingency plan was reviewed as a desktop exercise. The contingency plan complied with the required structure for contingency plans including content. In addition the Cyclone & Local Flooding contingency plan for the East Pilbara was reviewed. The plan includes the following: • WaterCorp & External contacts; • Water supply; • Wastewater schemes; • Pre-cyclone actions and frequencies; • Recovery action Checklists; • Alert details and contacts; • Services by agreement; and • Consequences of the event on infrastructure. The structure of simple contingency plans include: • Asset information; • General information for the asset; • Emergency response equipment; • Pump performance s by operational mode; • Contingency plans; • Reference documents; and	In addition to the current update frequencies prioritise the update of contingency plans based on risk should be considered e.g. Use the ARA process to identify high risk assets and then update the associated contingency plan. The relationship between ARA and Contingency plans is currently being scoped.

Item No.	Testing	Observations	Recommendations
		• Links to other documents. Documents are stored on the document management system "AquaDoc". Updates of the plans are version controlled and dated within the system. The frequency of plan updates is identified above, generally every 3 years or when the contingency plan is applied during an event and found to require changes. Updates are also dependent on the criticality of the plan.	
3.	**Review the testing of contingency plans and identify documented evidence of improvements to contingency plans.**	The testing of contingency plans involve three different tests depending on criticality: • Desktop every 2 years; • Simulation every 3 years; and • Field Simulation every 5 years. The above tests are coordinated centrally. Dam breaks are tested once every 5 years. Asset related contingency plans are not tested as they are subject to frequent failures e.g. main breaks. Effort is focused on the preparation to manage the failure. However maintenance plans for assets have asset tests to be applied by operators e.g. generator sets.	No Recommendations
4.	**Review the availability of incident and emergency management plans for each site**	The draft contingency guidelines state that contingency plans include specific strategies and actions to deal with specific variances in the levels of services. They also	The concept behind the NW region spreadsheet should be integrated with the corporate

Item No.	Testing	Observations	Recommendations
		include a monitoring process and "triggers" for initiating planned actions. Emergency management plans means an emergency plan, or revised plan under regulation 75 of the Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007. As such they are different documents. Personnel in the North West Region stated that incident and emergency management plans are the same as contingency. This created confusion in discussion with personnel and needs to be clarified. In stating the above, not all schemes in a region have contingency plans. There is also a reliance on older versions of contingency plans that have yet to be updated. Emergency management plans e.g. Cyclone events define the response process for managing the event after it occurs. North West Region has set up a spreadsheet containing the responses to events on each scheme (operational contingency plans). This spreadsheet provides the region with the actions required to restore a failure should a failure occur in remote sites. The spreadsheet is in many ways a reference guide for specific failures.	system such that it becomes accessible to all personnel responsible for repairing operational failures. The naming convention for Contingency planning needs to be clarified and defined to WaterCorp personnel with the view to eliminating confusion between the terms incident management, emergency management and contingency planning.
5.	**Review testing regime and scenario runs for emergency management plans**	Refer testing of contingency plans in Test No. 3 above.	No recommendations

Item No.	Testing	Observations	Recommendations
6.	**Identity and assess whether emergency management plan test results are actioned**	Emergency Management Plan testing is managed centrally (Perth) within the incident management register. The Emergency Management Committee overseas all emergency management activity. Records of incident management plan test details and outcomes are recorded in incident management system. Emergency management plans are used by the Aroona Alliance at the major facilities e.g. Woodman Point. During the review, results of the plan tests were sighted and actions assigned for actioning.	No recommendations
7.	**Assess the adequacy of staff understanding and training related to contingency planning.**	It should be noted that personnel fall into the following categories. • Civil assets (non trade personnel) meet certificate 2 & 3 of national qualifications; and • Mech & Elec (trade personnel) subject to standard qualifications. As such they are qualified personnel who understand the operational requirements of assets. Training requirements are documented in "Review the testing of contingency plans…" above. Staff at Karratha were tested on the contingency plans for a pump station power failure during a cyclone event. They went through the tasks that would be undertaken as a result of a failure and stepped through the overall process	No recommendations

Item No.	Testing	Observations	Recommendations
		during a cyclone event. During the test the procedures were provided to review the stated process with the manual. As a result of the test it was found that the personnel had a sound understanding of the processes and tasks associated with a pump station power failure both during a cyclone event and under normal conditions.	

Documents sighted

- Building Emergency Management Plan - Marble Bar - East Pilbara, May 2001
- Doc ID 01-1169, Building Emergency Management Plan - Yule Pump Station - East Pilbara, November 2011
- Doc ID 365727, Contingency Management Plan - Burst Water Main - East Pilbara
- Contractor Induction Report-Water Corporation HSE Contractor Induction Report by Inductee Name
- PM-#1311512-v3-draft ss contingency guidelines
- Valve Incident memo Nov 2011
- WPS Meckering Main Conduit Zone 1, September 2010
- Contingency Management Plan – Cyclone & Local Flooding – East Pilbara, April 2012
- Wastewater - SPS and Pressure Mains - Overflows - Contingency - East Pilbara 2
- Doc ID 01-1939, Wastewater - SPS and Pressure Mains - Overflows - Contingency - East Pilbara, June 2003
- Woodman Point Doc, Incident Report, October 2010
- Woodman Point WWTP - Balancing dam information Sept 11
- Woodman Point Valve Incident Presentation to WW Governance Committee Dec 11
- PM-#1311512-v3-draft ss contingency guidelines
- PM-#2353912-v3-S110 Incident Management source document, September 2009
- PM-#365710-v1-Wastewater - Reticulation - Overflows - Contingency - East Kimberley, June 2003

- PM-#365714-v1-Wastewater - SPS and Pressure Mains - Overflows - Contingency - East Kimberley, May 2003
- PM-#365715-v1-Wastewater - SPS and Pressure Mains - Overflows - Contingency - East Pilbara, June 2003
- PM-#440245-v3-Contingency Plan - Alarm - Waterford PMA, Jan 2010

10. FINANCIAL PLANNING

Key Process	Outcomes	Effectiveness Criteria
The financial planning component of the asset management plan brings together the financial elements of the service delivery to ensure its financial viability over the long term.	A financial plan that is reliable and provides for the long-term financial viability of the services.	• The financial plan states the financial objectives and strategies and actions to achieve the objectives • The financial plan identifies the source of funds for capital expenditure and recurrent costs • The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets) • The financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period • The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services • Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary

Test No.	Testing	Observations	Recommendations
1	**Identify and inspect processes and associated documentation.**	Under the Water Corporation Act, a Statement of Corporate Intent (SCI) and a Strategic Development Plan (SDP) are required to be submitted to Government each year. The SDP has a five year horizon and is WaterCorp's agreement with its shareholder, the Minister for Water, on key emerging issues, our economic and financial objectives and operational targets, and how these objectives and targets will be achieved.	No Recommendations

Test No.	Testing	Observations	Recommendations
		The SDP identifies the business strategies in regard to WaterCorp's role and responsibilities defined within legislation and its commitment to sustainability. The SDP must receive concurrence from the Treasurer of WA before agreement by the Minister. Essentially, it provides a five year view on the strategic focus and financial plan for the Water Corporation. The formal first drafts of the SCI and SDP are submitted to the Minister at the end of December. This first draft is used to populate the Strategic Information Management System upon which the Budget process is facilitated. The formal final drafts of the SCI and SDP are then confirmed after the May State Budget and submitted to the June Board Meeting for approval ahead of being submitted to the Minister by the end of June. The Statement of Corporate Intent (SCI) is a 1 year plan representative of the first year of the SDP. Financial planning documentation includes: • Financial Accounting Manual; • Financial Management Framework; • Micro budget guidelines 2012/13; • Macro budget guidelines 2012/13; and • Finance group roles and responsibilities.	

Test No.	Testing	Observations	Recommendations
		Additional information is located on WaterNet – Financial Management page.	
2	**Random inquiry as to the knowledge of staff of the procedures**	The determination of future funding at WaterCorp is to a large degree a bottom up process with respect to the operations and capital planning. Branch and Region plans are developed for operating and maintenance costs while the capital costs are generated through the capital investment process. These costs are then compared to the expected budgets. During the review and associated meetings, WaterCorp personnel involved in the financial planning were tested with respect to the procedures. All personnel were aware of the part of the financial planning they were involved in and had a broad understanding of how the processes they undertake fit with the overall financial plan.	No Recommendations
3	**Obtain a copy of the current financial plan including budget/actual and assess its alignment with the processes.**	A financial plan does not exist as a single document within WaterCorp. The SDP and SCI are supported by a number of documents e.g. Capital investment plan, Strategic asset management plan. Customer plan, I.T. strategy and Customer strategy. The output of these documents becomes input to the SDP. Each of these documents were sighted during this review. The SDP includes financial objectives of WaterCorp along with the financial statements derived from the information contained in the above documents. The process for assembling the SDP is documented.	No Recommendations

Test No.	Testing	Observations	Recommendations
		All financial data is recorded electronically in SAP and can be presented in many ways. SAP allows the data to be aggregated in many formats through the reports. Financial reporting is undertaken through the Annual Plan. The SDP is supported by the capital and operating budgets which in turn are supported by the: • 5 year process plan; • Business direction; and • 1 to 2 year branch and regional plans. WaterCorp adopts a bottom up approach to the development of the budgets accounting for Regional expenditure with respect to operations and maintenance. In addition to this a rigorous risk based process is adopted for the development of capital budgets. The capital budget incorporates renewal analysis which is undertaken to identify the funding for the renewal of existing assets. Demand modelling and performance monitoring is undertaken to identify the need for the upgrade or creation of new infrastructure. Together these budgets are incorporated into the SDP off-set against Treasury constraints. The regions and central branches are responsible for the quality of data used to provide input into the SDP. Recommendations regarding the data quality are provided in the other asset management functions within this report	

Test No.	Testing	Observations	Recommendations
		that support the development of the SDP. It should be noted that the finance branch check the integrity of data to monitor the accuracy and reliability of the financial data. The improvement to the quality of data is an ongoing concern for WaterCorp with improvements to data and changes in processes adopted to improve data quality.	
4	**Test the financial plan for:** **a. identification of sources of funds,** **b. projections of profit and loss,** **c. balance sheets,** **d. prediction of income for at least five years,** **e. operations,** **f. maintenance,** **g. administrative and** h. **capital expenditure requirements.**	The financial plan includes: • The Water Corporation sources funds from Treasury and developer contributions; • Projection of profit and loss is through the BPR – Board/Exec Package (sighted on-line); • Balance sheets are contained in both the BPR – Board/Exec Package and Annual Report (2011); • Prediction of income for at least five years is contained within the SDP (not sighted)[8]; • Operations is contained in the BPR – Board/Exec Package; • Maintenance is contained in the BPR – Board/Exec Package; • Administration is contained in the BPR – Board/Exec Package; and • Capital expenditure requirements contained in the BPR – Board/Exec Package. The capital investment program executive summary has	No Recommendations

[8] Prior to finalising this report the five year projections were sighted

Test No.	Testing	Observations	Recommendations
		been sighted along with the SDP financial outcomes 2011/12 to 2015/16 in PM-#8340569-v1-SDP_-financial_inputs. Examples of the projected financial outcomes include the following: • Total revenue; • Direct Operating expenses; • Developer's contributions; • Depreciation; • Operating profit before and after income tax; • Capital expenditure before and after interest; • Borrowings repaid; • Net debt; • Accruals to government; • Operating subsidies; and • Financial performance indicators. In addition to the balance sheet the Annual Report (2011) financial section contains: • Cash flows; • Depreciation; • Capital commitments; • Expenses; • Loans and borrowings; and • Revenue.	
5	**Examine current financial plan and establish whether processes have**	As discussed previously the financial planning process consists of numerous sub-processes including relationships with operations and capital planning and acquisition	No Recommendations

Test No.	Testing	Observations	Recommendations
	been followed.	processes. Throughout this review, it was evident that processes are actively followed and monitored. The processes at the higher financial planning consolidation level are no exception. Finance personnel are located in each Branch and Region to assist in this process. The rigid adherence to processes and the integration of detailed planning processes both centrally and within the regions along with the sub-processes identified in test 2 above allows WaterCorp to develop a robust financial plan that reflects the findings from the supporting processes. It is our opinion based on the funding development processes used, the expenditure analysis and the business performance reporting that WaterCorp is producing appropriate financial forecasts under the current constraints of Treasury. Recommendations on the improvement to data quality have been provided in the supporting asset management functions of this report.	
6	**Examine if corrective action is taken where significant variances are identified.**	Variances are identified in the business performance reporting. Every month each department comments on variances identified. Corrective action is considered under the monthly forecast review. This is supported by the monthly review of capital programmes and individual capital projects in addition to the monitoring of operations and maintenance budgets in the regions.	No Recommendations

Test No.	Testing	Observations	Recommendations
		Personnel were tested on their knowledge of the variance process. It was clear that all personnel involved in the management of budgets and projects were involved and understood the process.	

Documents sighted

- PCY112 – Delegated Financial and Legal Authorisations, November 2011
- Doc ID 1255448, Roles and Responsibilities - finance group, February 2009
- PM-#7383187-v1-Financial Management AMSER 2012
- PM-#367406-v9-Macro Budgeting Guidelines 2012-13
- PM-#367407-v10-Micro Planning Guidelines 2012-13
- PM-#1246726-v13-S026 Financial Management Framework, April 2009
- PM-#7032356-v1-Key Management Priorities Funding Guidelines, February 2012
- PM-#7564768-v1-AMSER 2012 Capital Plan 5 year (part 1)
- PM-#7564774-v1-AMSER 2012 Capital Plan 5 year (part 2)
- PM-#8340569-v1-SDP_-financial_inputs

11. CAPITAL EXPENDITURE PLANNING

Key Process	Outcomes	Effectiveness Criteria
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. **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 5 years would usually be based on firm estimates.**	A capital expenditure plan that provides reliable forward estimates of capital expenditure and asset disposal income, supported by documentation of the reasons for the decisions and evaluation of alternatives and options.	• There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates • The plan provide reasons for capital expenditure and timing of expenditure • The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan • There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned

Test No.	Testing	Observations	Recommendations
1	**Identification and inspection of process documentation.**	Capital Expenditure Planning has the following process documentation: • Capital Investment Policy; • Capital Investment Guidelines;	No Recommendations

Test No.	Testing	Observations	Recommendations
		• Acquisition Guidelines; • Prioritisation Guidelines; • External Approvals Manual; • Program Managers Guideline; • Post Delivery Guideline; and • Strategic Investment Business Case Guidelines. Supporting the above are the following documents: • 2012/13 CAPEX Plan; • Strategic Investment Business Cases (SIBC's); • Capital Investment Committee Terms of Reference; • Capital Investment Management Committee Terms of Reference; and • Capital Investment Management Committee – Action List. The process documentation is readily available on the Intranet.	
2	**Obtain copy of capital expenditure plan for the current year and assess whether the process is being followed.**	A copy of the Executive Summary – 2012/2013 Capital Investment Budget, Board Meeting May 2012' was obtained. This document portrays the capital investment process detailing the following: • Key Themes; • Current situation showing the changes that have occurred since the October 2011 Board Paper; • Recommendations for the 2012/13 CIP under the	No Recommendations

Test No.	Testing	Observations	Recommendations
		business areas; • Strategic investment prioritisation process and budget allocations by major investment category; • Program Delivery; and • Program Risks. The capital investment committee is responsible for the following: • Approval of guidelines and procedures for the Plan/Acquire Assets processes and assigning roles and responsibilities; • Monitoring of resources available for capital delivery; • Endorsement of changes in financial delegation of capital; • Monitoring of capital reporting i.e: monthly business performance reports and quarterly reporting to the Board; • Noting project delivery business cases and cumulative variations > $7.5million; • Providing support to the GM Planning and Capabiity; • Providing a forum to discuss stakeholder issues; and • Monitoring of project delivery risk. The capital investment committee incorporates the following positions:	

Test No.	Testing	Observations	Recommendations
		• GM Planning and Capability; • Chief Financial Officer; • GM Regional Customer Services; • GM Metro Customer Services; and • GM Acquisition. The 2012/13 capital investment budget was sighted initially for $1,071.2million allocated to business level program budgets. Business level program budgets are developed from the bottom up however they are constrained by the high level budget constraint by Treasury. The budget has allowances for: • Cashflow timing change; • Carbon pricing adjustment; • Specialist projects e.g. West Canning Basin Project; • Capital cost index reduction. The budget is actively managed by the capital investment committee through the Business Process Reporting. The supporting projects are managed by the programme managers and project managers and reported through the Project Management Reporting System. The project performance is aggregated within the system to provide input into the Business Performance Reporting System.	

Test No.	Testing	Observations	Recommendations
		In addition to the above a continuous improvement process is used to identify and implement any improvements identified internally or externally via consulting reports. It is our opinion that the processes adopted by WaterCorp are robust and applied rigorously.	
3	**Test the capital investment plan for:** **a. identification of issues,** **b. actions proposed,** **c. responsibilities,** **d. timing,** **e. compatibility with asset life, and** **f. the condition identified in asset management plans.**	It is the strategic investment business cases that justify the capital projects. The business cases identify: • Business drivers/issues; • Asset risks; • Available options; • Project scope (actions), costs, timing and project implementation; • Change in risk profile; and • Business impacts. SIBC's consider economics of options considering run to failure method practicing replacement at end of an assets economic life or whether renewal is required now (or in the near future) to prevent catastrophic impact to the business should the asset fail. The options analysed contains an age based renewal option (option 4) that takes into account the assets theoretical financial life. It is recognised that this option would be more suitable in a highly risk averse organisation. Renewal programs are generally based on any	No Recommendations

Test No.	Testing	Observations	Recommendations
		combination of parameters: • Consequence of failure; • Asset Condition; • Work order failure data; • AR information; and • Prioritised using Risk. The asset condition obtained through the asset condition assessment process is used to identify the likelihood of failure involved with the asset. Coupled with the consequence of failure the risk is used to prioritise the projects. Renewals are identified within one of the 4 renewal SIBC's that feed the capital expenditure planning process. Two renewal SIBC's were inspected: • Water production and Storage; and • WW Treatment and Pumping Renewals. The Operational Information and Control Programme (including SCADA) SIBC was also sighted. WaterCorp's capital program has been largely driven through growth in previous years and will continue in future years. Demand modelling is undertaken to identify future funding of new assets. Performance monitoring is undertaken to identify the need for infrastructure upgrade	

Test No.	Testing	Observations	Recommendations
		funding needs. However with the constraint imposed by Treasury there is ongoing pressure to identify non-capital solutions. The introduction of the Optioneering process supports this outcome by empowering personnel to identify options that may not require capital projects but instead identify maintenance or operational solutions. Renewal expenditure has been largely developed through standard asset lives and year constructed. The Cardno/Atkins report of the Corporations capital and operating expenditure commissioned by the ERA indicated that renewal expenditure is lower than expected being 11% of planned capital expenditure ($110million/year). An analysis of renewal undertaken by WaterCorp indicates the renewals should be approximately $150million p.a. rising to $300million p.a. by 2030. Renewal analysis will be an ongoing process. As the supporting data improves e.g. condition, asset life, fault history, performance improves then so will the modeling and therefore the required future renewal programme funding. It is our opinion that while the renewal expenditure at this point in time may not be adequate, the overall capital budget appears to be adequate. The collection of quality data will either confirm this or require adjustments to the renewal component of the budget in the future. Recommendations for supporting processes identified in	

Test No.	Testing	Observations	Recommendations
		this report will assist in improving the knowledge of renewal requirements.	
4	**Examine current capital investment plan and assess frequency of review.**	The capital investment plan is reported to the Board on a quarterly and yearly basis. The report includes comparison of budgets and actual costs with variances identified against each project. Where variances of significance are identified actions are identified to rectify the variance. In addition to the above the capital investment plan for each region is monitored and reported monthly. In addition, the capital investment committee reviews the status monthly and reports to the Board quarterly.	No Recommendations
5	**Assess how supporting documentation and reasons impact on the capital investment plan.**	The Capital investment plan can be influenced by external drivers as identified in the Strategic Asset Management Plan resulting from the environmental scanning process and other research. Issues such as energy management, climate change, water efficiency, sustainability, growth have been identified as key strategic issues that will influence the capital investment plan in the short and long term. Key points for consideration include: • Maturing Regulatory Framework – ensure compliance with regulatory standards; • Climate Change – balance supply and demand considering climate resilient options; • Growth – cater for increasing demand across the	No Recommendations

Test No.	Testing	Observations	Recommendations
		State; • Progressively aging assets – optimal time to replace assets; • Emerging technologies – advancing with technological changes; • Rising energy costs - need to be more efficient due to rising energy costs; and • Human capital – having the right skills, right people, right timing. WaterCorp is currently in the process of addressing the above issues. In the short term asset renewals due to poor performance / condition and ageing infrastructure have an impact on the capital investment plan. The Asset Renewal team with the Asset Management Branch is currently developing specific renewal and replacement programs through the development of the SIBC's.	

Documents sighted

- PM-#2772884-v1-Capital Investment Committee (CIC) - Meeting No 9 - 19112009 - Attachment 3 2 - BPR Capital Investment Summary, October 2009
- PM-#1807007.v12-Capital Investment Branch Continuous Improvement Team Meeting (CIBCIT) - Action List
- PM-#2324709.v16-Capital Investment Branch Executive Meeting - Rolling Actions Register - 2009
- Capital Investment Committee - Terms of Reference, March 2009
- Doc ID 1647660, Capital Investment Management Committee - Terms of Reference, March 2009
- PM-#2388055.v54-Capital Investment Management Committee CIMC - Action List, July 2012
- CIB Website Document - Reference - Formulation of Capital Investment Program for 2009 2010 - 2013 2014 - Reference 797, September 2008
- Doc ID 4802340, External Approvals Manual, February 2012

- PM-#4574647-Water Production and Storage AR Strategic Investment Business Case Renewals, June 2011
- PM-#4646336-WW Treatment and Pumping Renewals Strategic Investment Business Case Renewals, May 2011
- Doc ID 2721044, Program Managers Guideline, June 2010
- PM-#4054887-v3A-Strategic Investment Business Case - Growth - Water - Country
- PM-#6784253-v1-Strategic Investment Business Case- Growth- Wastewater- CountryDoc ID 5952436 v2 - SIP Guideline, January 2011
- SIBC Presentation, 2012
- PM-#6758487-v12-Board Meeting 15 May 2012 - Capital Investment Budget 2012-2013

12. REVIEW OF AMS

Key Process	Outcomes	Effectiveness Criteria
The asset management system is regularly reviewed and updated.	Review of the Asset Management System to ensure the effectiveness of the integration of its components and their currency.	• A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current • Independent reviews (e.g. internal audit) are performed of the asset management system

Item No.	Testing	Observations	Recommendations
1.	**Identify and inspect process and supporting documentation.**	As part of the corporate planning, the following documents are supported: • Statement of Corporate Intent; • Strategic Development Plan; and • Statement of Corporate Strategy. These documents are supported by the Strategic Asset Management Plan (SAMP) and supporting Asset Class strategies. Both these two documents feed into Strategic Investment Business Cases (SIBC). The SAMP articulates the link between Asset Management and Corporate Planning. The SAMP describes the overall philosophy and strategic approach to the management of the assets over a 20 year horizon.	No Recommendations

Item No.	Testing	Observations	Recommendations
		It achieves this by priding a series of recommendations against each of the strategic issues. It also provides for summary prioritisation of capital expenditure across the state. In addition to the above the Business Plan articulates the objectives of the Corporation and the supporting 3 Year action plan. The objectives are then filtered down from the CEO to the business groups where business group actions are developed to achieve the corporate objectives. Asset Management sits under the Planning & Capability group. The Strategic Investment Business Cases consider areas of business focus and describe options to achieve nominated business outcomes together with capital investment requirements to deliver each option over the 20 year horizon. The accountability matrix documents the AM services provided and the managers accountable for each service. A continuous improvement process is in place. Each branch identifies improvements that are then discussed and prioritised accordingly. A change management register exists to assist in the program development and monitoring.	
2.	**Examine and test processes associated with asset**	Internal reviews have been undertaken within the review period to identify improvements to the asset	No Recommendations

Item No.	Testing	Observations	Recommendations
	management system updating.	management system. This also included external reviews e.g. WSAA Asset Management benchmarking. In addition to the above reviews, the MR&A group undertake yearly audits within a three year program that include a review of asset management processes. The outcomes of the internal audits are recommendations for improvements that are then monitored.	
3.	**Consider the need to update the asset management plan based on the results of the asset management system review.**	The Strategic Asset Management Plan (SAMP) contains recommendations for improvement for each group within the SAM Branch. Recent reviews such as this one and the WSAA benchmarking project have identified additional improvements.	As a result of this review and the WSAA benchmarking, the SAMP should be updated to include the recommendations compiled in this review that are relevant for each group in the SAM Branch. This consolidation would allow the internal and external recommendations to be captured in the one improvement register.
4.	**Identify any internal reviews in the review period and the uptake of any recommendations from such reviews.**	The following internal reviews have been undertaken during the 2009 -2012 period: • SAMP Update and Review; • Asset Management Review; • System capability Framework; • Renewals planning Review;	No Recommendations

Item No.	Testing	Observations	Recommendations
		• Reviews associated with change management register; • End to End Asset Creation Process (2012 – 2013); • Asset Planning Process (2012 – 2013); • Asset Pre-funding Process (2012 – 2013); • Delivery of Planned Maintenance (2011 – 2012); • Adherence to Planning and Design Standards (2011 – 2012); • Dam Safety Management (2011 – 2012); • Review of Engineering Asset Design (2011 – 2012); • Management (2010-2011); • Asset Handover By Developers and Project Management (2009 – 2010); • Assets Built Fit for Purpose (2009 – 2010); • Critical Infrastructure (Operational) (2009 – 2010); • Asset Data Integrity (2009 – 2010); and • Asset Maintenance Management (2009 – 2010). All project s identified above before 2011 – 2012 have been completed. The remaining projects assigned dates against them are in progress.	

Documents sighted

- Water Corporation Business Plan 2012/13 – 2014/15

- Strategic Asset Management Plan, March 2012
- WSAA Asset Management Benchmarking 2012, GHD
- PM-#2294473-v3-Strategic Asset Management Plan, March 2009
- PM-#2255647-v4A-JH old version Water Retic Asset Class Plan, June 2010
- PM-#7529229-v1-Renewals Planning - summary of AMR outcome for AMSER 12
- Review of Engineering Asset Design Management, June 2011
- Review of Asset Handover by Developers, September 2009
- Review of Asset Handover by Project Management, October 2009
- Review of Asset Maintenance Management, November 2010
- Review of Assets Built Fit for Purpose, October 2010
- Review of Critical Operational infrastructure, September 2010
- PM-#6807581-v3-Asset Reviews for 3 Years - Wayne's Request - spreadsheet

REVIEW STATEMENT

Odysseus-imc Pty Ltd has completed the 2012 Asset Management Effectiveness Review. The review examined the measures taken by WaterCorp (the licensee) for the proper management of the assets used in the provision and operation of services and where appropriate, the construction or alteration of relevant assets.

Odysseus-imc Pty Ltd believes the findings in this document are an accurate reflection of the outcomes of the review.

Sandy Muir

Director

Odysseus-imc Pty Ltd

19 Smiley Road

Broadmeadows Vic 3047

Date Signature Attached: 16th October, 2012

Appendix A – Documents Sighted

AMSER 2012

Electronic Documents

Document No.	Document Title
AMSER 2012-001	Strategic Asset Management Plan 2012/13
AMSER 2012-002	PM-#870553-v4-Guideline for Plan Monitor and Assess Asset Performance Condition and Risk Process, November 2011
AMSER 2012-003	PM-#1164951-v9C-Assess Asset Capability, June 2009
AMSER 2012-004	PM-#2099953-v1-NWR - Broome Water Supply Scheme - PC255 - Value Management Study Record February 2009
AMSER 2012-005	PM-#3623527-v2D-Infrastructure Planning Process Manual, March 2012
AMSER 2012-006	PM-#3955820-v4A-PCY344 Manage Asset Capability, November 2010
AMSER 2012-007	PM-#3955854-v5-PCY343 Asset Assessment, November 2010
AMSER 2012-008	Infrastructure Planning Branch Management System Map
AMSER 2012-009	Our Assessment of Asset Condition, Performance & Risk - Process Story
AMSER 2012-010	PM-#4216636/2-TAM Process Measures and Data
AMSER 2012-011	PM-#365270-v3-AM - Planning - Procedure for AM - Perth Region, July 2004
AMSER 2012-012	PM-#365273-v1-AM - Planning - Procedure for AM - North West Region, August 2002
AMSER 2012-013	PM-#365409-v3-Asset Management - Planning - South West Region, March 2011
AMSER 2012-014	PM-#4574647-Water Production and Storage AR Strategic Investment Business Case Renewals, June 2011
AMSER 2012-015	PM-#4646336-WW Treatment and Pumping Renewals Strategic Investment Business Case Renewals, May 2011
AMSER 2012-016	Doc ID 4351658, Admin Manual - System Capability Matrix, March 2011
AMSER 2012-017	Doc ID 3571033, System Capability Matrix - SCM - User Manual, September 2011
AMSER 2012-018	Doc ID 5754454, User Manual - System Capability Forecasting, April 2012
AMSER 2012-019	PM-#2974514-v29-ARA Business Rules, July 2010
AMSER 2012-020	PM-#7140764-v1-ARA Session 2

Document No.	Document Title
AMSER 2012-021	PM-#7571071-v1-Consequence factors for sewer DST
AMSER 2012-022	PM-#5681583-v5-Change Management Programming
AMSER 2012-023	PM-#6900493-v12-Gravity Sewers Strategy Statement
AMSER 2012-024	PM-#3709104 - Bore Sites, Asset Class Plan, Project Management Plan, September 2011
AMSER 2012-025	PM-#6360290.v1 - Cathodic Protection Systems, Asset Class Plan, January 2012
AMSER 2012-026	PM #3692962.v11 - Disinfection Systems Asset Class Plan, April 2012
AMSER 2012-027	PM-#6247363.v1- Electric Motor Asset Class Plan, February 2012
AMSER 2012-028	PM-#2895106-v3D-Farmland Mains Asset Class Plan, August 2010
AMSER 2012-029	PM-#2892984.V8 - Main Sewers Asset Class Plan, August 2012
AMSER 2012-030	PM-#5568184.V1-Power Distribution Asset Class Plan, June 2011
AMSER 2012-031	PM-#6231423.v1-Project Management Plan of the Instrumentation Asset Class Plan, Project Management Plan, January 2012
AMSER 2012-032	PM-#5568058.v1-Pump Equipment Asset Class Plan, May 2011
AMSER 2012-033	PM-#2892940.v14-Retic Sewers Asset Class Plan, August 2010
AMSER 2012-034	PM-#4619204-SCADA Asset Class Plan, March 2011
AMSER 2012-035	PM-#3810387-Switchboards Asset Class Plan, June 2010
AMSER 2012-036	PM-#894965.v12B-Trunk and Dist Mains Asset Class Plan, August 2010
AMSER 2012-037	PM-#4374634.v8-Wastewater Pressure Mains Asset Class Plan, June 2011
AMSER 2012-038	PM-#3808830-Water Meter Asset Class Plan, June 2010
AMSER 2012-039	PM-#3087652-Water Retic Mains Asset Class Plan, August 2010
AMSER 2012-040	PM-#3633112-Water Storage Project Management Plan, September 2010
AMSER 2012-041	PM-#7424462-v1-AMSER 2009 Implementation Update - Jan 2012
AMSER 2012-042	Asset acquisition definitions, March 2011
AMSER 2012-043	Doc ID 2367933, Asset Acquisition Guidelines, September 2009
AMSER 2012-044	Doc ID 4539246v4, Deliver Phase, June 2012
AMSER 2012-045	Doc ID 4539248v4, Handover and Close, July 2012
AMSER 2012-046	Doc ID 4539206v4, Infrastructure Planning Phase, June 2012
AMSER 2012-047	Doc ID 4539210v4, Renewals and Planning Phase, June 2012

Document No.	Document Title
AMSER 2012-048	Doc ID 4539237v4, Scope Phase, June 2012
AMSER 2012-049	Doc ID 4539210 v4, Select Phase, June 2012
AMSER 2012-050	PM# 4144599/2, Great Southern Towns Water Supply Scheme, Operating Plan 2011-12
AMSER 2012-051	PM#40230082/4, West Pilbara Water Supply Scheme, Operating Plan 2011-12
AMSER 2012-052	PM-#2116684-v2A-C-W00122 Wungong Transfer Main Stage 2 Integration Commissioning Plan, November 2007
AMSER 2012-053	PM-#2427475-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 2 Regulating Valve 1000REGV2690 Report DRAFT 120809
AMSER 2012-054	PM-#2545913-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Plan Signed, December 2007
AMSER 2012-055	PM-#3244426-v4-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 1 Banking Report & Results, March 2010
AMSER 2012-056	PM-#3478877-v3-C-W00122 Wungong Transfer Main Stage 2 Commissioning Report, August 2011
AMSER 2012-057	PM-#3597590-v1-C-00122 Wungong Transfer Main Stage 2 Commissioning Session 1 NRPS to Wungong Dam Banking Summarised Results March 2010
AMSER 2012-058	PM-#4407121-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 4 Regulating Valve Trials Results November 2010
AMSER 2012-059	PM-#4408008-v2-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 4 Report regulating valve 1000REGV2690 November 2010
AMSER 2012-060	PM-#5308372-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 3 Report July 2010 Banking & Water Hammer Tests
AMSER 2012-061	PM-#5466631-v3-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 5 Results 1000REGV2690 Rev2, April 2011
AMSER 2012-062	PM-#5466656-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 5 Report
AMSER 2012-063	PM-#5506496-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Punchlist
AMSER 2012-064	PM-#6325631-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 6 Regulating Valve REGV2690 Procedure
AMSER 2012-065	PM-#6358205-v1-C-W00122 Wungong Transfer Main Stage 2 Commissioning Session 6 Results 1000REGV2690 Kv February 2012
AMSER 2012-066	PM-#3608804-v2-PMB Website Record - Armadale McNeil Road SPS Type 40 - CS01278 - Close Out Report 595, October 2010
AMSER 2012-067	Guidelines for Plan, Monitor & Assess Asset Performance, Condition and Risk Process,

Document No.	Document Title
	October 2011
AMSER 2012-068	PM-#6813814-v1-Decommission & Dispose Assets - Guideline, October 2011
AMSER 2012-069	PM-#6813821-v1-Decommission & Dispose Assets - Plan, October 2011
AMSER 2012-070	PM-#2759026-v2-Disposed Assets 2008-2009
AMSER 2012-071	PM-#364856-v4-PCY233 Disposals, June 2011
AMSER 2012-072	PM-#367588-v5-S087 Disposals Standard, June 2011
AMSER 2012-073	PM-#404111-v3-PCY268 Water Corporation Accountabilities Framework, November 2011
AMSER 2012-074	PM-#2492016-v5B-Decommission and Dispose Assets, October 2011
AMSER 2012-075	PM-#3955810-v5-PCY342 Decommission and Disposal of Infrastructure Assets, October 2010
AMSER 2012-076	PM-#6813814-v1-Decommission & Dispose Assets - Guideline, October 2011
AMSER 2012-077	PM-#6813821-v1-Decommission & Dispose Assets - Plan, October 2011
AMSER 2012-078	Doc ID 2217251, Plan - Decommission & Dispose Assets, October 2011
AMSER 2012-079	Doc ID 3955820, Policy - PCY344 Managing Asset Capability, November 2010
AMSER 2012-080	Doc ID 3571033, System Capability Matrix - SCM - User Manual, September 2011
AMSER 2012-081	Doc ID 2492016, Guideline-Decommission & Dispose Assets, October 2011
AMSER 2012-082	Doc ID 2217251, Plan - Decommission & Dispose Assets, October 2011
AMSER 2012-083	Doc ID 3955810, Policy - PCY342 Decommission and Disposal of Infrastructure Assets, October 2010
AMSER 2012-084	Accountabilities Policy – PCY 268
AMSER 2012-085	PM-#404111-v3-PCY268 Water Corporation Accountabilities Framework, November 2011
AMSER 2012-086	Water Corporation, Customer Charter
AMSER 2012-087	Water Corporation Organisational Structure
AMSER 2012-088	Doc ID 1818884, Corporate Environment Scan March 2009
AMSER 2012-089	From Strategy to Action Roadmap, 2011/12
AMSER 2012-090	PM#617596v1 - Water Corporation 2006-07 National Performance Framework Review Final Report - 06 Nov 07
AMSER 2012-091	PM-#4640032-v4A-110308 WC Environment Scan #4530221 FINAL, March 2011
AMSER 2012-092	PM-#5870235-v9-111005 Water Corp - Environment Scan, January 2012

Document No.	Document Title
AMSER 2012-093	PM-#6921078-v1-120524 WaterCorp News Analysis - End 25 May 2012
AMSER 2012-094	PM-#6977327-v2-120605 WaterCorp News Analysis - End 8 June 2012
AMSER 2012-095	PM-#5630577-v5-Corporate SCADA Strategy 2011, December 2011
AMSER 2012-096	PM-#7174962-v1-ERA Pricing Inquiry 2012 Cardno Report Capex Opex Review Water Corporation Draft v2, June 2012
AMSER 2012-097	Levels of Service Register- Woodman Point
AMSER 2012-098	Woodman Point WWTP - Balancing dam information Sept 11
AMSER 2012-099	Woodman Point - Valve Incident memo Nov 2011
AMSER 2012-100	RCA Report - Woodman Pt PST System
AMSER 2012-101	Board Executive Pack, June 2012
AMSER 2012-102	S110 Incident Management, 29 September 2009
AMSER 2012-103	PM-#3655044-v1-Plan Asset Operations Process and Guideline, June 2014 (or 2012)
AMSER 2012-104	PM-#3088972-v8-Desludging Process - Assessment Planning and Operation, July 2012
AMSER 2012-105	PM-#3254672-v1-S394 Pressure Sewer Systems - Grinder Pumps - Under Review, Nov 2009
AMSER 2012-106	PM-#3518204-v3-Trunk and Distribution Mains Risk Based Inspection Procedure, July 2010
AMSER 2012-107	PM-#3955868-v4A-PCY340 Scheme and Asset Operations, November 2010
AMSER 2012-108	PM-#4825140-v1-Bridgetown Greenbushes Regional Water Supply Scheme Operating Plan-Process Control Table-Part B, July 2011 to June 2012
AMSER 2012-109	PM-#4653005-v1-Bridgetown Greenbushes Regional Water Supply Operating Plan-Process Control Table-2011-2012, Part A
AMSER 2012-110	PM-#5562607-v2-ESPERANCE Water Supply Scheme Operating Plan-Process Control Table-Part B, July 2011 to June 2012
AMSER 2012-111	PM-#5540861-v1-ESPERANCE Water Supply Scheme, 2011 to 2012
AMSER 2012-112	PM-#4465661-v4-Hopetoun Water Supply Scheme, Operating Plan 2011-2012
AMSER 2012-113	PM-#4351171-v4-Hopetoun Water Supply Scheme Operations Plan – Part B, 2011 to 2012
AMSER 2012-114	Doc ID 3955868, pcy340-Scheme and Asset Operations, November 2010
AMSER 2012-115	Plan Asset Operations, June 2014 (or 2012)
AMSER 2012-116	PM # 2347410.v13-Safety, Security and Environmental (SSE) inspections, May 2011
AMSER 2012-117	Scheme Operations Plans Index

Document No.	Document Title
AMSER 2012-118	PM-#3948919\4-Whatscheme Water Supply Scheme Operating Plan 2012 - 2013, Part A
AMSER 2012-119	PM-#3948921\4-Whatname Scheme Operations Plan – Process Control Table Template
AMSER 2012-120	Doc ID 5711368, SWMS - Blockages Port Hedland, October 2011
AMSER 2012-121	Doc ID 4121126, Training Process
AMSER 2012-122	PM-#457125-v3-PCY298 Buried Asset Damage Prevention, April 2011
AMSER 2012-123	PM-#459635-v3-S151 Annex A to Appendix 2 Schematics of Key Criteria, August 2007
AMSER 2012-124	PM-#459636-v3-S151 Annex A to Appendix 3 Risk Profile - Working at Heights, August 2007
AMSER 2012-125	PM-#459638-v2-S151 Annex B to Appendix 4 Inspection of Equipment, August 2007
AMSER 2012-126	PM-#459639-v4-S151 Appendix 1 Definitions References and Standard Drawings, August 2007
AMSER 2012-127	PM-#459641-v3-S151 Appendix 3 Working at Heights Risk Management, August 2007
AMSER 2012-128	PM-#459642-v2-S151 Appendix 4 FIPS Prevention of Falls Standard, August 2007
AMSER 2012-129	PM-#459643-v3-S151 Appendix 5 Competencies, August 2007
AMSER 2012-130	PM-#459644-v3-S151 Appendix 6 Guide to Rescue Planning, August 2007
AMSER 2012-131	PM-#580769-v1-S151 Annex A to Appendix 4 Guide to Types of FIPS for Use in the WC, August 2007
AMSER 2012-132	PM-#580770-v1-S151 Appendix 2 Summary of Key Criteria for Prevention of Falls Standard, August 2007
AMSER 2012-133	PM-#580792-v6-S151 Prevention of Falls, July 2010
AMSER 2012-134	PM-#4520405-v1-Woodman Point PST RCA – October to November 2010, March 2011
AMSER 2012-135	PM-#5827623-v3-Woodman Point WWTP - Cape Peron Effluent Pipeline - Control Valve, November 2011
AMSER 2012-136	PM-#7387871-v1-AMSER 2012 Audit Asset Operations Session, July-August 2012
AMSER 2012-137	PM-#7568694-v1-East Pilbara Training Records 05 09 2012
AMSER 2012-138	Corporate SCADA Strategy, December 2011
AMSER 2012-139	Doc ID 368565.V2.1, SCADA Infrastructure Plan, January 2006
AMSER 2012-140	SCADA key document relationships, April 2012
AMSER 2012-141	PM-#4619204-SCADA System Asset Class Plan - Published Version 1, March 2011
AMSER 2012-142	SIBC OIC SCADA, May 2011

Document No.	Document Title
AMSER 2012-143	PCY267 - Creation and Support of SCADA Systems - 15 November 2011, February 2012
AMSER 2012-144	PM-#7574000-v1-Operator Checklists- Process Coordinators Checklist Woodman Point WWTP
AMSER 2012-145	PM-#7574021-v1-Pre Start Meetings- Daily Pre-start Form
AMSER 2012-146	PM-#7572690-v1-BPR – Wastewater Treatment Performance Scorecard, July 2012
AMSER 2012-147	Doc ID 4121126, Skills Recognition Process For Water Industry Workers Valve Incident Memo - Faulty Butterfly Valve on Woodman Point Effluent System, Nov 2011
AMSER 2012-148	Incident Record #4065 – Woodman Point Primary Sedimentation Tanks, October 2010
AMSER 2012-149	Woodman Point WWTP - Balancing dam information Sept 11
AMSER 2012-150	Woodman Point Valve Incident Presentation to WW Governance Committee Dec 11
AMSER 2012-151	PM-#2697658-v5A-WC-OSH-SWMS-002 Asbestos Pipe Removal and Disposal, October 2010
AMSER 2012-152	PM-#4868521-v2-WC-OSH-SWMS-084-Safe Use of Ladder Climbing Systems, May 2011
AMSER 2012-153	PM-#6966848-v1B-WC-OSH-093-SWMS Working on Contaminated Sites, October 2011
AMSER 2012-154	Corrective vs Preventative Maintenance 12 months
AMSER 2012-155	PM-#943077-v8-Disinfection systems, January 2009
AMSER 2012-156	Doc ID 1366665, Electrical mech civil-generic work instruction register
AMSER 2012-157	EMS Report - Wastewater Pump Stations & Pressure Mains (SP) and Wastewater
AMSER 2012-158	G&A report, December 2012
AMSER 2012-159	GSR report, December 2012
AMSER 2012-160	Doc ID 825046, Maintenance standards and continuous improvement register
AMSER 2012-161	Monthly report chlorine
AMSER 2012-162	Monthly report example
AMSER 2012-163	MWR report
AMSER 2012-164	NWR report
AMSER 2012-165	Doc ID 789957, Our Maintenance Story, December 2011
AMSER 2012-166	Doc ID 4126906, pcy341-asset maintenance, November 2010
AMSER 2012-167	PM-#3844201-V3-Plan Asset Maintenance Process and Guidelines
AMSER 2012-168	Planned Preventive Maintenance Performance - 10 Asset Classes - 12 Months to April 2012(1)

Document No.	Document Title
AMSER 2012-169	PM-#6827688-v1-Top 10 Tasks (With Order Type) - 12 months to April 2012
AMSER 2012-170	PM-#7175463-v1-EMS Report - Wastewater Pumping and Reticulation - 12 Months to June 2012
AMSER 2012-171	PM-#7387870-v1-AMSER Audit 2012 Maintenance Session, 2012
AMSER 2012-172	PM-#7430811-v1-EP PM04 completion 2011 12.XLS
AMSER 2012-173	WP PM04 completion 2011 12.XLS
AMSER 2012-174	PR Report
AMSER 2012-175	RCSG Report
AMSER 2012-176	Riverside Monthly Report, June 2007
AMSER 2012-177	Riverwise Example for Audit, June 2007
AMSER 2012-178	Doc ID 5399350, SAP PM Chlorination Fault Tasks, August 2012
AMSER 2012-179	PM-#825650-Standard Reports, June 2008
AMSER 2012-180	PM-#4216636/2-TAM Process Measures and Data, February 2011
AMSER 2012-181	Business Performance Reporting Board/Executive Pack, October 2011/12
AMSER 2012-182	Weekly Operations Report, 30 September 2009 (Subiaco, Beenyup, Woodman Point, Kwinana WWTP)
AMSER 2012-183	PM-#556032-v2-PCY237 Information Management Policy, November 2007
AMSER 2012-184	PM-#867740-v1-Southern Seawater Desalination Project IWSS Integration User Requirements Superseded by 1100079, June 2008
AMSER 2012-185	Doc ID 1138415, PCY315 Business Continuity Management, April 2012
AMSER 2012-186	Doc ID 1991393PCY328 Corporate Learning and Development, September 2011
AMSER 2012-187	Doc ID 400838, s055-Information Systems-Security Roles and Responsibilities, May 2010
AMSER 2012-188	Doc ID 400839, s056-Information Systems-Management Asset Management, May 2010
AMSER 2012-189	Doc ID 400840, s057-Information Systems-Security Business Continuity-IT Disaster Recovery, May 2010
AMSER 2012-190	Doc ID 400841, s058-Information Systems Security-Security Technology and Physical Security, May 2008
AMSER 2012-191	Doc ID 400842, s059-Information Systems Security-System Access Control, February 2011
AMSER 2012-192	PM-#7416396-v1-AMSER Audit - Asset Data Strategy
AMSER 2012-193	PM-#5540265-v2-Data Standards - SCF View

Document No.	Document Title
AMSER 2012-194	PM-#7416107-v1-AIS Strategy - webpage
AMSER 2012-195	PM-#7572690-v1-BPR – Wastewater Treatment Performance Scorecard, July 2012
AMSER 2012-196	Doc ID 404111, Accountabilities PCY 268, November 2011
AMSER 2012-197	PM # 1147064.v1F - ICT BCT Framework, July 2009
AMSER 2012-198	Doc ID 364943, Intellectual Property PCY 149, February 2009
AMSER 2012-199	PM # 1157167.v1K - ICT Incident Management Guidelines, June 2009
AMSER 2012-200	Privacy Policy PCY 252, July 2007
AMSER 2012-201	Doc ID 1960062, S103 Workgroup Server Backup and Recovery, April 2009
AMSER 2012-202	Water Corp Final Board Pack June 2012, July 2012
AMSER 2012-203	Doc ID 589729, Asset Handover Guideline, August 2008
AMSER 2012-204	PM-#699610-v3-PCY135 Risk Management Policy, April 2012
AMSER 2012-205	PM-#625204-v3-Risk Management Guidelines, September 2010
AMSER 2012-206	PM-#621047-v4A-S389 Risk Assessment Criteria, August 2009
AMSER 2012-207	SRP 2009 Strategic Risk Profile
AMSER 2012-208	PM-#3033115-v4-Asset Damage Risk Assessment Procedure, June 2010
AMSER 2012-209	PM-#852589.v3-Consequence Table Master
AMSER 2012-210	List - Critical Assets & Pinch Points & SCF - All Assets
AMSER 2012-211	Doc ID 2675129, System Risk Assessment - SRA - User Manual, February 2011
AMSER 2012-212	PM-#6686700.v2 - System Capability Forecasting Application - SCF - Presentation, Growth/Capacity Monitoring and Reporting
AMSER 2012-213	PM-#2882847-v3C-TRP Manage Wastewater Process Risk Profile
AMSER 2012-214	PM-#5492700-v1-2011 12 WWTB risk control report, July 2011
AMSER 2012-215	PM-#5492700-v1-2011 12 WWTB risk control report
AMSER 2012-216	PM-#6816057-v1-Critical Assets & Pinch Points & SCF - All asset list
AMSER 2012-217	PM-#7402923-v1-Wastewater System Capacity Presentation for Risk Management Committee August 2012
AMSER 2012-218	Doc ID 3571033, System Capability Matrix - SCM - User Manual, September 2011
AMSER 2012-219	Doc ID 5754454, User Manual - System Capability Forecasting, April 2012
AMSER 2012-220	PM-#5685593-v8D-Corporate OSH Risk Profile

Document No.	Document Title
AMSER 2012-221	PM-#7146265-v2-2012 Corporate Risk Report FINAL, June 2012
AMSER 2012-222	PM-#7571071-v1-Consequence factors for sewer DST
AMSER 2012-223	Accountabilities Framework
AMSER 2012-224	PM-#3528562-v1-Business Continuity Management - BCM - Guidelines, June 2010
AMSER 2012-225	Building Emergency Management Plan - Marble Bar - East Pilbara, May 2001
AMSER 2012-226	Doc ID 01-1169, Building Emergency Management Plan - Yule Pump Station - East Pilbara, November 2011
AMSER 2012-227	Doc ID 365727, Contingency Management Plan - Burst Water Main - East Pilbara
AMSER 2012-228	Contractor Induction Report-Water Corporation HSE Contractor Induction Report by Inductee Name
AMSER 2012-229	PM-#1311512-v3-draft ss contingency guidelines
AMSER 2012-230	Valve Incident memo Nov 2011
AMSER 2012-231	WPS Meckering Main Conduit Zone 1, September 2010
AMSER 2012-232	Contingency Management Plan – Cyclone & Local Flooding – East Pilbara, April 2012
AMSER 2012-233	Wastewater - SPS and Pressure Mains - Overflows - Contingency - East Pilbara 2
AMSER 2012-234	Doc ID 01-1939, Wastewater - SPS and Pressure Mains - Overflows - Contingency - East Pilbara, June 2003
AMSER 2012-235	Woodman Point Doc, Incident Report, October 2010
AMSER 2012-236	Woodman Point WWTP - Balancing dam information Sept 11
AMSER 2012-237	Woodman Point Valve Incident Presentation to WW Governance Committee Dec 11
AMSER 2012-238	PM-#1311512-v3-draft ss contingency guidelines
AMSER 2012-239	PM-#2353912-v3-S110 Incident Management source document, September 2009
AMSER 2012-240	PM-#365710-v1-Wastewater - Reticulation - Overflows - Contingency - East Kimberley, June 2003
AMSER 2012-241	PM-#365714-v1-Wastewater - SPS and Pressure Mains - Overflows - Contingency - East Kimberley, May 2003
AMSER 2012-242	PM-#365715-v1-Wastewater - SPS and Pressure Mains - Overflows - Contingency - East Pilbara, June 2003
AMSER 2012-243	PM-#440245-v3-Contingency Plan - Alarm - Waterford PMA, Jan 2010
AMSER 2012-244	PCY112 – Delegated Financial and Legal Authorisations, November 2011

Document No.	Document Title
AMSER 2012-245	Doc ID 1255448, Roles and Responsibilities - finance group, February 2009
AMSER 2012-246	PM-#7383187-v1-Financial Management AMSER 2012
AMSER 2012-247	PM-#367406-v9-Macro Budgeting Guidelines 2012-13
AMSER 2012-248	PM-#367407-v10-Micro Planning Guidelines 2012-13
AMSER 2012-249	PM-#1246726-v13-S026 Financial Management Framework, April 2009
AMSER 2012-250	PM-#7032356-v1-Key Management Priorities Funding Guidelines, February 2012
AMSER 2012-251	PM-#7564768-v1-AMSER 2012 Capital Plan 5 year (part 1)
AMSER 2012-252	PM-#7564774-v1-AMSER 2012 Capital Plan 5 year (part 2)
AMSER 2012-253	PM-#2772884-v1-Capital Investment Committee (CIC) - Meeting No 9 - 19112009 - Attachment 3 2 - BPR Capital Investment Summary, October 2009
AMSER 2012-254	PM-#1807007.v12-Capital Investment Branch Continuous Improvement Team Meeting (CIBCIT) - Action List
AMSER 2012-255	PM-#2324709.v16-Capital Investment Branch Executive Meeting - Rolling Actions Register - 2009
AMSER 2012-256	Capital Investment Committee - Terms of Reference, March 2009
AMSER 2012-257	Doc ID 1647660, Capital Investment Management Committee - Terms of Reference, March 2009
AMSER 2012-258	PM-#2388055.v54-Capital Investment Management Committee CIMC - Action List, July 2012
AMSER 2012-259	CIB Website Document - Reference - Formulation of Capital Investment Program for 2009 2010 - 2013 2014 - Reference 797, September 2008
AMSER 2012-260	Doc ID 4802340, External Approvals Manual, February 2012
AMSER 2012-261	PM-#4574647-Water Production and Storage AR Strategic Investment Business Case Renewals, June 2011
AMSER 2012-262	PM-#4646336-WW Treatment and Pumping Renewals Strategic Investment Business Case Renewals, May 2011
AMSER 2012-263	Doc ID 2721044, Program Managers Guideline, June 2010
AMSER 2012-264	PM-#4054887-v3A-Strategic Investment Business Case - Growth - Water - Country
AMSER 2012-265	PM-#6784253-v1-Strategic Investment Business Case- Growth- Wastewater- CountryDoc ID 5952436 v2 - SIP Guideline, January 2011
AMSER 2012-266	SIBC Presentation, 2012
AMSER 2012-267	PM-#6758487-v12-Board Meeting 15 May 2012 - Capital Investment Budget 2012-2013

Document No.	Document Title
AMSER 2012-268	Water Corporation Business Plan 2012/13 – 2014/15
AMSER 2012-269	Strategic Asset Management Plan, March 2012
AMSER 2012-270	WSAA Asset Management Benchmarking 2012, GHD
AMSER 2012-271	PM-#2294473-v3-Strategic Asset Management Plan, March 2009
AMSER 2012-272	PM-#2255647-v4A-JH old version Water Retic Asset Class Plan, June 2010
AMSER 2012-273	PM-#7529229-v1-Renewals Planning - summary of AMR outcome for AMSER 12
AMSER 2012-274	Review of Engineering Asset Design Management, June 2011
AMSER 2012-275	Review of Asset Handover by Developers, September 2009
AMSER 2012-276	Review of Asset Handover by Project Management, October 2009
AMSER 2012-277	Review of Asset Maintenance Management, November 2010
AMSER 2012-278	Review of Assets Built Fit for Purpose, October 2010
AMSER 2012-279	Review of Critical Operational infrastructure, September 2010
AMSER 2012-280	PM-#6807581-v3-Asset Reviews for 3 Years - Wayne s Request - spreadsheet

Appendix B – Interview Schedule

AMSER 2012

INTERVIEW SCHEDULE

DATE	TIME	PEOPLE	BRANCH[9]	PROCESS
Monday 30th July	9:00 – 10:30	Geoff Hughes Julia Krsnik Vijay Moorthy Russell Pascoe	SAM IPB	Asset Planning
	10:30 – 12:00	Jean Dujmovic Peter Harding Robert Glanville Carlos Castellano Kim Savage Mark Liang Hughes	SAM CIB IDB PMB OAM Asset Delivery Group Handover Group	Asset Creation and Acquisition
	12:30 – 14:00	Ken Walker Shane Oldham	SAM	Asset Disposal
	14:00 – 16:30	Duncan Bell Claire Bickford Michael Hastings	CS	Environmental Analysis
Tuesday 31st July	8:30 – 10:30	Paul Ranieri Andrew Klita Ivan Unkovich Kay Hyde Steve Little Steve Christie	SAM OAM WPB WWTB SD MESB	Asset Operations

[9] Refer to the Branch table at the end of this appendix

DATE	TIME	PEOPLE	BRANCH[9]	PROCESS
		Larry Mildern	AA PRA	
	10:45 – 12:15	Paul Ranieri Andrew Klita Larry Mildern Steve Little Steve Wisdom	SAM SD MESB AA PRA	Asset Maintenance
	12:45 – 14:00	Tino Galati Kris Barlow Brendan Hardy Paul Ranieri Larry Mildern Andrew Klita	SAM Various System Users SD MESB ISB	Asset Management Information System
	14:00 – 16:30	Ken Walker Mandy Damant	SAM R&A	Risk Management
Wednesday 1st August	8:30 – 10:30	Ken Walker Larry Mildern Steve Mcarthy	SAM SD	Contingency Planning
	10:45 – 12:00	Mike Giorgi Terry Hobson Vin Rees	FIN	Financial Planning
	12:30 – 14:00	Brian Robertson Jean Dujmovic Mike Taylor	CIB REG	Capital Expenditure
	14:30 – 17:00	Steve Wisdom Ian Henderson Michael Patterson	AA	Woodman Point (Asset Management)

DATE	TIME	PEOPLE	BRANCH[9]	PROCESS
		Michael Tschanz Cristiano Carvalho		
Thursday 2nd August	8:30 – 12:00	Evan Hambleton Ivan Unkovich Kay Hyde Steve Christie Richie Francis	AA	Woodman Point (Operations & Maintenance)
	13:00 – 15:00	Tino Galati	SAM	Review of the Asset Management System

PORT HEDLAND SITE INTERVIEWS

DATE	TIME	PEOPLE	BRANCH[10]	PROCESS
Monday 13th August		Neil Rowles	NW	Contingency Planning

[10] Refer to the Branch table at the end of this appendix

KARRATHA SITE INTERVIEWS

DATE	TIME	PEOPLE	BRANCH[11]	PROCESS
Tuesday 14th – Wednesday 15th August		Gilbert Goh	SAM NW	Asset Planning
		Norm Cull	NW	Asset Creation and Acquisition
		Gilbert Goh Norm Cull Paul Nolan	SAM NW	Asset Disposal
		Sharon Broad Vic Adoms Tammie Boladeros Gilbert Goh Paul Nolan Steve Farqhuar Ed Mountford	NW	Asset Operations
		Vic Adoms Paul Nolan Sharon Broad Ed Mountford John Snow	SAM NW	Asset Maintenance
		Paul Nolan	NW	Asset Management Information System
		Vic Adoms Sharon Broad Gilbert Goh Paul Nolan	NW	Risk Management

[11] Refer to the Branch table at the end of this appendix

NEWMAN SITE INTERVIEWS

DATE	TIME	PEOPLE	BRANCH[12]	PROCESS
Thursday 16th August		Rodney Hodson Neil Rowles	NW	Asset Maintenance

NOTE: During the sites visits the Odysseus-imc team were supported by Sugandree Muruvan and Ken Walker.

[12] Refer to the Branch table at the end of this appendix

	BRANCH
SAM	Strategic Asset Management
OAM	Operational Asset Management
ISB	Information Services
IPB	Infrastructure Planning
R&A	Risk and Assurance
PMB	Project Management
WPB	Water Production
CIB	Capital Investment
MESB	Mechanical & Electrical Services
WWTB	Wastewater Treatment
IDB	Infrastructure Design
SD	Service Delivery
FIN	Finance
CP	Corporate Planning
CSD	Customer Services Division
AMD	Asset Management Division
NW	North West Region
AA	Aroona Alliance
PRA	Perth Region Alliance
CS	Corporate Strategy

Appendix C – Status of 2009 Recommendations

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	WATERCORP COMMENTS	REVIEWER FEEDBACK
Key Process 1: Asset Planning					
Action 1: The program for the production of asset class plans (ACP) be accelerated.	WaterCorp personnel are relying heavily on the outputs from these plans	**TIMEFRAME EXTENDED**	**June 2013**	The original program of ACPs was to see delivery completed by June 2012. WaterCorp has ceased the production of ACPs and have now embarked on the development of 18 strategic statements. Ten strategic statements will be completed in 2012/13 with the remaining 8 to be completed in 2013/14.	**Sighted**
Action 2: Commence the analysis of the relationship between capital expenditure and maintenance costs.	While capital and maintenance programs are developed the impacts of each activity on the other is not assessed at this time.	**COMPLETE**	**June 2011**	Both the E2E review and the Integrated Service Delivery review have highlighted the need for greater focus on options analysis. This options analysis training is now complete for key staff responsible for making recommendations to address asset condition and/or capacity issues. In addition two other areas of work have been undertaken that also address this issue. The first is the new Strategic Investment Business Case process that looks to balance different capital spending scenarios against levels of service/operating costs outcomes. The second is the Asset Class Plan work where for the existing assets, the best mix of maintenance, condition assessment and renewals expenditure is examined.	**Sighted**

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	WATERCORP COMMENTS	REVIEWER FEEDBACK
Action 3: Improve the renewals forecasting by obtaining an appropriate tool to undertake the analysis and feed the asset class plan.	The efficiency of current renewals analysis is limited by the lack of availability of an appropriate tool and the quality of the existing data. .	**TIMEFRAME EXTENDED**	**Rescheduled - delayed due to lack of resources and restructure**	As part of the ongoing refinement of renewals forecasts in SIBCs, work is underway to procure or develop appropriate decision support tools for assessing renewal needs at a program and a project basis. In addition to using PARMS-Planning and LARM (Linear Asset Risk Model) for water mains, work is underway to trial APT (Asset Performance Tools)-Lifespan as a tool to assess the optimum time to invest in other types of assets such as M&E equipment. Work will also be undertaken in the next 12-18 months to refine the current decision support tool for main sewers and develop a risk based approach for sewer pressure mains. A project with CSIRO to review the currently available decision support tools and the appropriateness for the Water Corporation is currently being discussed – this links closely with some work they are currently undertaking for Water Research Foundation.	
Action 4: There is a need for an integrated communications strategy that improves the awareness and understanding of other Branches for the need and use of good quality data.	There is a data quality issue at the strategic level due to the need to collect the right data for renewals analysis.	**COMPLETE**	**Dec 2011**	The Data Quality Strategy has been approved. The recommendations have been incorporated in a broader ISB Review "Data Integrity" stream which will be working closely with the proposed Asset Information & Systems Team to provide focus on asset data over the next 18 months.	**Sighted**
Key Process 2: Asset Creation and Acquisition					

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	WATERCORP COMMENTS	REVIEWER FEEDBACK
Action 5: Include a section within the project file specifically for Quality Assurance incorporating all completed forms, checklists and reports. Aligning the hardcopy files to the electronic system in a manner that the project information can be easily found. This will improve the effectiveness of the project management process.	While the project files satisfy the QA system, when testing the projects, it was difficult to find the completed forms.	**COMPLETE**	**March 2010**		**Sighted**
Key Process 5: Asset Operations					

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	WATERCORP COMMENTS	REVIEWER FEEDBACK
Action 6: WaterCorp needs to catalogue specific training requirements in asset management as it covers a significant number of functions, separated into internal, external or combined training and seek appropriate bodies to provide training e.g. • ACEAM; • CIEAM; • IPWEA; or Specialist consultants.	There is a view within OAM that operational asset management capability is inconsistent across that state.	**COMPLETE**	**May 2011**	Job competencies for each of the asset management related regional positions were determined as part of the broader Alignment of Country Regions project. For each position a job profile was established that outlined both position accountabilities and also the required skill competencies. Positions under the revised job profiles were then called and staff was appointed to them based on being the best fit to the competencies requirements. An assessment has been made of the type of training needed to achieve effective asset management within Water Corporation. This covers a range of skills from the basic skills acquired as part of engineering or other technical training through to more job specific skills.	**Sighted**

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	WATERCORP COMMENTS	REVIEWER FEEDBACK
Action 7: To improve the data quality, WaterCorp should continue to place significant effort in data capture to complete the capture of the required asset characteristics.	There is a need to improve the quality of the data to enable improved decision making	**COMPLETE**	**March 2010**	MCS2 mobile devices rollout has been completed and is now being used to assess data quality for a number of key maintenance/ops measures. Significant effort is and will continue to be applied to improve assist registration data. The FLER Improvement project has been closed and the actions now moved to business as usual. The data improvement work is now aligned with the roll out of new maintenance standards and will continue for several years. Changes have been made to MCS2 to capture changes to asset characteristics. The requirement for characteristics is now incorporated into Requirements Registers under the new Asset Acquisition process.	**Sighted**

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	WATERCORP COMMENTS	REVIEWER FEEDBACK
Action 8: While there is a space in the incident management report for root-cause analysis, it was not filled in. The incident report should document the root-cause analysis completion, the analysis document and the date completed.	There is a need to link root cause analysis to incident reporting.	**IN PROGRESS**	**April 2010**	The Incident Management system was developed in response to a recommendation of the 2006 Operating License Audit for a system based approach to recording and reporting of incidents. (This license requirement for reporting of incidents to the ERA was removed from July 2009). The current IMS has recently been modified to require Root Cause Analysis to be completed at the time that the incident is recorded. IMS is currently one of a number of systems that contain incident related information. Other systems include Site safe and risk registers. The sustainability of multiple systems is currently being considered by the business. One outcome could be the retirement of a number of current system (such as IMS), and replacement of a single system that contains all information, including root cause analysis. It is proposed to do no further work to IMS, but focus attention on conceptualising an integrated business solution that captures all hazards and incidents.	During the review it was evident that the incident report does not have the required links to root cause analysis documentation nor sufficient information to identify when the analysis had been completed or where it was located. Future system will need to be able to provide the links.
Key Process 6: Asset Maintenance					

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	WATERCORP COMMENTS	REVIEWER FEEDBACK
Action 9: Continue to review and complete process documentation including maintenance standards and procedures.	Documentation is in the process of being finalised.	**COMPLETE**	**June 2011**	Completed. Incorporated into Plan Asset Maintenance Process.	**Sighted**
Action 10: Demonstrate alignment between the maintenance strategy and the asset class plans once each plan is completed.	The maintenance strategies have been developed based on discussions between SAM and TAM and the SAMP as opposed to documented asset class plan output.	**ON TARGET**		Maintenance gaps/ areas for improvement identified in the ACPs are captured in the Asset Class Plan Change Register. Maintenance Strategies have been developed in parallel to the ACP's. The intent was to finalise ACP's and then prioritise gaps/improvements from the Change Register. It must be noted that 83% of all assets requiring preventive maintenance regimes are already covered by Maintenance Standards, which are currently being revised to reflect the revised Maintenance strategy.	**Sighted**

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	WATERCORP COMMENTS	REVIEWER FEEDBACK
Action 11: Review the regions for consistency of application of corporate requirements.	The G&A region is applying corporate requirements well however, it cannot be assumed that all regions are doing likewise as there is a view within OAM that operational asset management capability is inconsistent across that state.	**COMPLETE**	**Dec 2011**	As part of the Alignment of Country Regions project managed by Regional Customer Services Group work has been done to: ▪ Determine resource requirements across each region to deliver consistent process outcomes ▪ Develop revised (and consistent) job profiles for each of the asset related positions within the regions ▪ Appoint staff to the positions .	
Action 12: Implement a formal training program for asset managers specifically designed to improve the skill base.	Improve consistency of application across the Regions.	**COMPLETE**	**June 2011**	Formal awareness training has been developed and delivered. The Maintenance Support team trains and supports all regions as it addresses maintenance planning issues in target regions. Detailed training will be developed from the lessons learnt from working one-on-one with users in the maintenance support team. The Maintenance Support Team completed Perth Region May 2010. Agricultural Region and SW Region were completed during 2010/11.	**Sighted**

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	WATERCORP COMMENTS	REVIEWER FEEDBACK
Action 13: Either focused training or improved treatment options should be identified to provide non-capital solutions as alternatives to capital.	It was felt that the condition rating process and gap treatment tended towards capital expenditure as the solution to the asset condition as a first pass while there could be potential for a maintenance solution to provide an appropriate improvement.	**COMPLETE**	**May 2011**	A training course to improve asset managers/capability manager's options analysis skills was developed with assistance of external consultants. Course included basic options analysis concepts and also some case studies for participants to work through. The courses were run for all key staff in the first half of 2011. Each participant was also provided with an Options Analysis Manual. In addition a new set of business rules and associated training has been rolled out for the ACA/ADR system.	**Sighted**
Action 14: Increase the level of activity based planning training.	Activity based planning is also undertaken to refine the maintenance requirements during budget planning. Concern was expressed for additional activity based planning training.	**IN PROGRESS**	**June 2010**	All Maintenance Planners will receive appropriate ABP training.	Evidence of ongoing ABP training has not been provided
Key Process 7: Asset Management Information System					

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	WATERCORP COMMENTS	REVIEWER FEEDBACK
Action 15: Data collection, management and development should be identified as a key process on the accountability framework.	There are data quality issues however it is not clear as to which Manager is responsible.	**COMPLETE**	**31 Dec 2011**	Two corporate reviews relating to data quality and management of data have developed two key recommendations to establish: 1) an Information Management Competency Centre (incorporating asset related data) and 2) an Information & Systems Team in Asset Management. The broad role and responsibility framework including accountability for data has been endorsed by Executive. Specific data accountabilities have been allocated to the ISB and AM groups.	
Action 16: Data improvement is an ongoing process and while a program is in place to improve asset characteristics it would be better served to assist the data capture through the use of mobile devices and the implementation of Stage 2 mobile applications.	Mobile devices are required to improve the efficiency in data collection.	**COMPLETE**	**May 2010**	MCS2 has been implemented and use of GPS technology for location of faults is being implemented.	

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	WATERCORP COMMENTS	REVIEWER FEEDBACK
Action 17: A local GIS Strategy within AMD should be developed to identify improved use of the GIS e.g. development of "measle" maps illustrating geographically, areas of poor condition, poor performance assets and localised areas of high risk. This could assist in cost effectiveness reviews and expenditure on improved system performance as opposed to individual asset performance. The use of GIS for displaying time based impacts of the capital program on the local asset profile is another use.	G&A are using the GIS to produce maps of corrective maintenance along the Kalgoorlie pipeline to assist analysis and demonstrate the usefulness of the data capture in the Districts to local personnel.	**COMPLETE**	**December 2012** – Functionality. Priority projects will be sequentially delivered over the next three years.	Water Corporation has entered a contractual agreement with GE Smallworld for the joint development of their Water Office suite of GIS products. The increased functionality of this product will be sequentially implemented over the next few years. Measle maps are now available for pipe repairs on reports generated from the mobile computing system and are delivered to regions monthly.	**Sighted**
Key Process 8: Risk Management					
Action 18: When a failure is recorded and subsequently completed the risk review should be undertaken as part of the incident process and identified on the incident form e.g. who reviewed the risk, when it was reviewed and what the outcomes were.	The current 6 monthly risk reviews will capture the changes in risk but not in a timely manner.	**NOT COMPLETED**	**Feb 2010**	Commissioning and Handover Guidelines adjusted for inclusion of change in risk profile. First audit conducted and triggers are being established for future reviews.	Based on our review we have not seen any evidence that the risk reviews have been completed for asset failures as opposed to capital delivery.

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	WATERCORP COMMENTS	REVIEWER FEEDBACK
Action 19: A training program regarding the interpretation of consequences, likelihood of failure and risk should be developed and introduced to the Asset Managers.	The application of risk analysis is sometime misinterpreted by the asset managers.	**IN PROGRESS**	**Feb 2011**	The System Risk Assessment User Manual has been completed and has been provided to those involved with the leading and undertaking of risk assessment development in all Regions & Branches. Additional ongoing training is provided during the 6 monthly facilitated workshops.	The training programme is being developed and roll-out to the Asset Managers has commenced but is not yet completed across the Regions.
Key Process 10: Financial Planning					
Action 20: Clear definitions of renewal, upgrades and replacement are required to be defined, implemented across WaterCorp and consistently applied. This will assist the SAM branch with its analysis of the funding gap.	While a definition of capital is defined, there is no clear definition of renewals and upgrades. This has implications with the ability of WaterCorp to understand to what degree they are funding asset consumption also referred to as the "funding gap".	**COMPLETE**	**May 2011**	Documentation of a "renewals" process has been completed, which outlines how to identify renewals requirements as against upgrades or standards driven capital expenditure. In addition we have undertaken some work to redefine the asset categories against which we will collect capital expenditure.	
Key Process 11: Capital expenditure Planning					

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	WATERCORP COMMENTS	REVIEWER FEEDBACK
Action 21: The business cases as well as including risk mitigation could provide the ability to incorporate other parameters such as carbon emission reduction, social benefits, and environmental benefits etc.	The feeling is that major capital projects are getting priority over smaller projects and as such it may be appropriate to review the parameters and weighting applied and give consideration to cost effectiveness of expenditure e.g. cost/benefit	**IN PROGRESS**	**June 2010**		Aspects of the required action have been incorporated into the SAMP and business cases e.g. wastewater treatment and pumping renewal business case has elements of the benefits based on levels of service e.g. odours and overflows (environmental). However, a formalised approach for the business cases should be developed.

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	WATERCORP COMMENTS	REVIEWER FEEDBACK
Action 22: An additional analysis could be undertaken to examine an individual high cost project against a group of lower cost projects to determine the cost effectiveness outcomes e.g. where to spend the money for the best outcome.	The feeling is that major capital projects are getting priority over smaller projects and as such it may be appropriate to review the parameters and weighting applied and give consideration to cost effectiveness of expenditure e.g. cost/benefit.	**COMPLETE**	**June 2011**	Water Corporation participated in an industry wide review of capital prioritisation coordinated through WSAA. The Review has produced a Guideline document for capital prioritisation which Water Corporation has considered in formulating its own process. WC now has a two stage process that looks at: • High level allocation of funding between competing Strategic Investment Business Cases • Prioritisation of funding for projects for the budget allocation within the various SIBCs. This process was used for the first time in May/June 2011 to formulate the capital program.	

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