

2009 Post Review Implementation Plan

Water Corporation Western Australia

December 2009



Odysseus-imc Pty Ltd
Infrastructure Management Consultants

APPROVAL

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INTRODUCTION

Water Corporation (WaterCorp) is required to undertake an asset management system effectiveness review (AMSER) on a two to three yearly basis. It is understood that this is a requirement of its regulatory license and that similar reviews have been undertaken in the past namely 2002, 2004 and 2006.

The outcomes of the 2009 review are identified in the AMSER 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).

This report is an impartial review of WaterCorp's asset management effectiveness under the ERA guidelines.

The review conducted between September 2009 and November 2009 examined the asset management processes used by the Water Corporation in delivering the services to its customers. These services 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 will be 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 2009 Effectiveness Review the maturity 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. The following changes have been made:

- Asset Disposal has been elevated from 3 to 4.

All other processes are deemed to be stable.

Asset Management System	Maturity Rating					
Process	0	1	2	3	4	5
Asset Planning					X	
Asset Creation/Acquisition					X	
Asset Disposal					X	
Environmental Analysis						X
Asset Operations					X	
Asset Maintenance					X	
Asset Management Information System					X	
Risk Management						X
Contingency Planning					X	
Financial Planning					X	
Capital Expenditure Planning						X
Review of the AMS					X	

TABLE 1 – ASSET MANAGEMENT MATURITY RATINGS

The above ratings are based on the following maturity definitions:

- 0 – Not performed
- 1 – Performed informally
- 2 – Planned and tracked
- 3 – Well defined
- 4 – Quantitatively controlled
- 5 – Continuously improving

WaterCorp has responded to the recommendations identified in this report and provided input into the post review implementation plan in the following table.

IMPLEMENTATION PLAN - 2009

Asset Management Process	Issue	Recommendation	Response/Action	Responsibility	Timing of Actions
Asset Planning	The expectations of WaterCorp personnel are that the asset class plans will drive decision making and are seen as important documents.	It is recommended that the program for the production of asset class plans be accelerated as WaterCorp personnel are relying heavily on the outputs from these plans. Alternatively WaterCorp will need to manage expectations because personnel are awaiting plan completion.	<p>An agreed schedule of asset class plans has been presented to the Executive group and to all other stakeholders. In presenting the schedule we have also made staff aware of what to expect from asset class plans.</p> <p>Specific asset classes to be completed in each financial year are listed in the "Timing" column.</p>	MSAM	<p>2009/10</p> <ul style="list-style-type: none"> • Trunk and Distribution mains • Farmlands mains • Water reticulation mains • Main sewers • Reticulation sewers • Meters • Switchboards <p>2010/11</p> <ul style="list-style-type: none"> • Water storages (tanks / reservoirs) • Bore sites • Motors • Power distribution • Pumping

Asset Management Process	Issue	Recommendation	Response/Action	Responsibility	Timing of Actions
					equipment <ul style="list-style-type: none"> • Disinfection systems • SCADA/Local control equipment 2011/12 <ul style="list-style-type: none"> • Wastewater Pressure mains • Control Valves (PRVs, AIVs etc) • Instrumentation • Cathodic Protection Systems • Drainage • Buildings • Civil Structures
	<p>While capital and maintenance programs are developed the impacts of each activity on the other is not assessed at this time.</p>	<p>Commence the analysis of the relationship between capital expenditure and maintenance costs.</p>	<p>Several reviews have recently been undertaken into the capital delivery process. Each of these has looked at the 'options analysis' phase of capital delivery and specifically looking to ensure that our business cases rigorously assess whole of life costs when determining</p>	<p>MSAM</p>	<p>The increased focus on options analysis will be progressively ramped up as we roll out the outcomes of the most recent capital delivery review project in early 2010.</p>

Asset Management Process	Issue	Recommendation	Response/Action	Responsibility	Timing of Actions
			preferred options. Asset staff have been presented with information clearly outlining that minimisation of 'whole of life' costs is our key objective.		
	The efficiency of current renewals analysis is limited by the lack of availability of an appropriate tool and the quality of the existing data.	Improve the renewals forecasting by obtaining an appropriate tool to undertake the analysis and feed the asset class plan.	It has been recognised that there is a need for consistent decision support tools for renewals and work is underway to develop these. Progress has been made with linear assets with PARMS Planning for water retic and an economic model for trunk and distribution mains. Tools for the other asset classes will be developed as part of the ACP delivery with a consistent approach to risk and the economic analysis.	MSAM	Models will be developed as part of development of each ACP. According to ACP schedule over the next 3 years (detailed previously).
	There is a data quality issue at the strategic level due to the need to collect the right data for renewals analysis.	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	Action planned is for a corporate review on Data Quality lead by ISB, generated from the discussion on data quality at	MISB	Still to be determined. Indicative start at this time is April 2010.

Asset Management Process	Issue	Recommendation	Response/Action	Responsibility	Timing of Actions
		quality data.	the Executive's IMC Meeting.		
Asset Creation and Acquisition	While the project files satisfy the QA system, when testing the projects, it was difficult to find the completed forms.	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.	<p>The current PMB file structure has a folder specifically for Quality (Section 9). This is where the relevant Primary Documents, checklists etc, are required to be filed. Compliance with this filing requirement forms part of regular internal quality audits.</p> <p>With the implementation of Aqua Docs it has become necessary to carry out a review of the "Soft Copy" filing of Primary documents, this is currently taking place. This review will also identify Project records required to be archived indefinitely.</p>	<p>MPMB</p> <p>MPMB</p>	<p>Complete</p> <p>March 2010</p>
Asset Disposal		No Recommendation			
Environmental Analysis		No Recommendation			

Asset Management Process	Issue	Recommendation	Response/Action	Responsibility	Timing of Actions
Asset Operations	Currently, there is a view within OAM that operational asset management capability is inconsistent across that state.	<p>It should be recognised that asset management training, in particular specific accredited asset management training for the water industry is not readily available. Training has been provided in the past by specialist consultants as part of their services.</p> <p>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.</p> <ul style="list-style-type: none"> • ACEAM; • CIEAM; • IPWEA; or • Specialist consultants. 	<p>BROAD ASSET MANAGEMENT TRAINING APPROACH</p> <p>The Asset Management Council currently delivers training to Corporation staff and this is supplemented by Corporation material in the “Asset Fundamentals” course. It is a generic course applicable to a wide range of Corporation staff.</p> <p>In addition Corporation is interacting with the WSAA Asset Management Committee to determine scope for industry based asset management training.</p> <p>Further specific training requirements will be identified based on staff competency requirements and assessments.</p>	MOAM	<p>OAM competency requirements will be identified by 30 September 2010.</p> <p>Competency assessments will be completed by 31 December 2010.</p> <p>Availability of training providers will be identified by 31 March 2011.</p>

Asset Management Process	Issue	Recommendation	Response/Action	Responsibility	Timing of Actions
		<p>Specific training should include:</p> <ul style="list-style-type: none"> • Asset Management Roles and responsibilities (OAM vs Region); • Activity based planning; • Works planning (Capital vs Maintenance); • The use of systems at WaterCorp; and • The importance and use of supporting data within WaterCorp. 	<p>SPECIFIC ASSET MANAGEMENT TRAINING</p> <p>Training will be provided to appropriate staff in the 5 specified areas.</p>	MOAM	<p>Specified training by:</p> <p>30 March 2010</p> <p>By 30 June 2010.</p> <p>Competency assessment by December 2010.</p> <p>Competency assessment by December 2010.</p> <p>Review to commence April 2010.</p>
	There is a need to improve the quality of the data to enable improved decision making	To improve the data quality, WaterCorp should continue to place significant effort in data capture to complete the capture of the required asset characteristics.	Mobile Computing System 2 (MCS2) is being implemented as an appropriate vehicle to improve the quality of operations and maintenance data.	MSAM	Rollout commences March 2010

Asset Management Process	Issue	Recommendation	Response/Action	Responsibility	Timing of Actions
			<p>A Centralised Asset Registration Team has been resourced to provide FLER registration capability to the Asset Handover Team. Process and work instructions have been developed and are now being refined.</p> <p>Data quality is being enhanced by the FLER Improvement Project and the staged implementation of preventative maintenance plans by asset class.</p>	<p>MTAM</p> <p>MTAM</p>	<p>Complete</p> <p>FLER project will commence in March 2010 and be completed by December 2010.</p>
	There is a need to link root cause analysis to incident reporting.	While there is a space in the incident management report for root-cause analysis, it is not filled in. The incident report should document the root-cause analysis completion, the analysis document and the date completed.	<p>Completion of the root cause analysis field has recently been made compulsory within the Incident Management System.</p> <p>Consideration will be given to options which ensure that all relevant information is included in instances where root cause analysis has been undertaken. IMS training courses will reinforce the need for appropriate completion of this field.</p> <p>Modifications will be</p>	MSD	By April 2010

Asset Management Process	Issue	Recommendation	Response/Action	Responsibility	Timing of Actions
			considered after training and a review of completed reports.		
Asset Maintenance	Documentation is in the process of being finalised.	Continue to review and complete process documentation including maintenance standards and procedures.	<p>Integration of Planned Preventative maintenance Process to be finalised and integrated with Deliver Services Process.</p> <p>High level Process document describing Process, intent, and expected outcomes.</p> <p>Procedures for Planned Preventive Maintenance Process steps.</p> <p>Process for Planned Corrective and Corrective to be developed.</p>	MTAM	<p>June 2010.</p> <p>June 2010.</p> <p>June 2011.</p> <p>June 2011.</p>
	The maintenance strategies have been developed based on discussions between SAM and TAM and the SAMP as opposed to documented asset class plan output.	Demonstrate alignment between the maintenance strategy and the asset class plans once each plan is completed.	It has already been agreed that any maintenance strategies developed ahead of the corresponding asset class plan will be reviewed once the asset class plan is completed. Where necessary	MSAM	Will occur in accordance with the ACP schedule (as detailed previously) as necessary.

Asset Management Process	Issue	Recommendation	Response/Action	Responsibility	Timing of Actions
			changes will be implemented.		
	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.	Review the regions for consistency of application of corporate requirements.	An assessment of the application of key processes will be undertaken in consultation with Process Owners and required remedial actions identified.	MOAM	30 December 2010
	Improve consistency of application across the Regions.	Implement a formal training program for asset managers specifically designed to improve the skill base.	Maintenance Support Team has been established to work with Regional OAM and Alliance personnel to give hands-on training and to establish a Maintenance Planning capability and support mechanism. Focus in 2009/10 is on 3 priority regions, followed by others in 2010/11. Training materials and a training program will be developed during this hands on training.	MTAM	Commenced Perth Region Nov 2009. Complete PR, G&AR and SWR by June 2010 and others by June 2011.
	It was felt that the condition rating process and gap treatment tended towards capital	Either focussed training or improved treatment options should be identified to provide	Training on ACA, ADR and Gap Treatments has commenced.	MTAM	Awareness training by Dec. 2009. Detailed training will

Asset Management Process	Issue	Recommendation	Response/Action	Responsibility	Timing of Actions
	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.	non-capital solutions as alternatives to capital.	Awareness training on option analysis has commenced and detailed training will be rolled out in 2009/10. Option analysis is also being emphasised above, under Asset Planning.		be delivered by June 2010.
	Activity Based Planning (ABP) is also undertaken to refine the maintenance requirements during budget planning. Concern was expressed for additional activity based planning training.	Increase the level of activity based planning training and develop a metric to monitor personnel progress through the training.	Staff currently have access to both an ABP training manual and a registered training course. We will ensure that all Maintenance Planners have appropriate training. Work is also progressing in maintenance planning and work scheduling which should improve the knowledge of users.	MOAM	All Maintenance Planners will receive appropriate ABP training by 30 June 2010.
Asset management information system (AMIS)	There are data quality issues however it is not clear as to which Manager is responsible.	Data collection, management and development should be identified as a key process on the accountability framework.	Data accountability to be determined on selected data as part of the PI Data Quality Project.	MSAM	PI-ANT project due to be delivered end January 2010.
	Mobile devices are required to improve the efficiency in data	Data improvement is an ongoing process and while a program is in place to improve asset	The new MCS(2) has better functionality for location feedback of pipe failures. This	MSAM	MCS2 is to be implemented during

Asset Management Process	Issue	Recommendation	Response/Action	Responsibility	Timing of Actions
	collection.	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.	information is to be mapped and sent back to Regions for validation.		first half of 2010.
	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.	<p>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.</p> <p>The use of GIS for displaying time based impacts of the capital program on the local asset profile is another use.</p>	<p>Current functionality of GIS is limited and cannot deliver measle-maps. New applications will be delivered as part of a program of work to upgrade the GIS capability for better asset management functionality. A strategy has been developed – WaterCorp Integrated Spatial Environment (WISE) and this program will be delivered on an incremental rollout over the next three years.</p> <p>Functionality will be available by December 2012. The planned functionalities identified in the strategy address the examples referred to in the</p>	MSAM	Priority projects will be sequentially delivered over the next three years. Functionality by December 2012.

Asset Management Process	Issue	Recommendation	Response/Action	Responsibility	Timing of Actions
			recommendation.		
Risk Management	The current 6 monthly risk reviews will capture the changes in risk but not in a timely manner.	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 SRA provides an audit trail of changes made. Plan is to implement an audit process to review update of risks as a consequence of project completion on a 6 monthly basis to commence in February 2010.	MTAM	To commence February 2010.
	The application of risk analysis is sometime misinterpreted by the asset managers.	A training program regarding the interpretation of consequences, likelihood of failure and risk should be developed and introduced to the Asset Managers.	A User Manual for the System Risk Assessment application is currently being developed and will clearly identify how consequence and likelihood should be interpreted.	MTAM	June 2010
Contingency Planning		No Recommendations			
Financial Planning	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	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.	The current End-to-End review of the asset creation process has identified the need for Strategic Investment Business Plans for asset replacement/ renewal. Implementation of this approach will greatly assist in	MIPB	Rollout will occur over the next three years. Each asset class replacement / renewal SIBP will be specified in the relevant Asset Class Plan (timeframe

Asset Management Process	Issue	Recommendation	Response/Action	Responsibility	Timing of Actions
	gap".	Develop metrics to measure progress with rolling out the SIBPs for replacement/renewal.	understanding the current expenditure and linking this to levels of service and future expenditure requirements for asset renewal/replacement.		detailed previously)
Capital Expenditure Planning	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	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 Corporation has recently incorporated quantitative carbon costing into its business case assessment. Social and environmental costs and benefits are currently quantitatively assessed in planning sustainability assessments. Work is currently being undertaken to determine methods to consistently quantify these aspects in project assessments.	MP&E	Pilot testing in March 2010. Target is to complete version 1 in June 2010.
	As above.	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 do I spend the money for	At a recent industry workshop on capital prioritisation there was discussion on how to incorporate a 'value for money' component into the prioritisation process. Water Corp are now looking at some	MSAM	Looking to implement a process in the first half of 2010.

Asset Management Process	Issue	Recommendation	Response/Action	Responsibility	Timing of Actions
		the best outcome.	options around overall risk mitigation per \$ spent for use as a comparative measure between projects.		
Review of the Asset Management System		No Recommendations			

ACTIONS YET TO BE COMPLETED – 2006 REVIEW

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	COMMENTS	REVIEWER FEEDBACK
<p>Action 11:</p> <p>Complete development of renewal strategies.</p>	<p>The renewal strategies for assets are under development</p>	<p>ON TARGET</p>	<p>Dec 2012</p>	<p>A renewals strategy has been outlined for water reticulation assets. This requires increases in funding beginning next year for metro assets and expenditure commencing as a regular annual budget allowance for country reticulation assets in year 5 of the capital program. Renewals strategies for Farmland mains and Trunk and Distribution mains are still under development as part of the respective Asset Class Plans. These are incorporating risk based approaches and are due in July 09 and Sept 09 respectively.</p> <p>The objective is to develop program business cases for all key asset classes to identify ongoing renewal funding needs. Major work has been done in water mains and an interim program set up for main sewers. These are the highest priority items. Currently other renewals are done via the ACA process and dealt with by Gap Treatment funding. A schedule for Asset Class Plan development, including renewals, has been established as a corporate priority.</p>	<p>Sighted</p>

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	COMMENTS	REVIEWER FEEDBACK
Action 12: SAM will establish the strategy for the other linear asset classes.	The renewal strategy for large main sewers is a reaction to a recent failure and has taken a low risk approach to this asset group	ON TARGET	June 2010	A renewals program has been included in the capital allowances to address large diameter concrete sewer mains subject to corrosion attack. An overall renewals strategy for the full set of sewer mains (main sewers and reticulation sewers) is still to be developed. This will be addressed as part of the Asset Class Plans for these two asset classes. Given current resources this will not occur until 2009/10 financial year. In the interim a program of work has been included in the forward capital program for inspection and relining of "at risk" main sewers. Significant expenditure on relining (in excess of \$5M pa) has occurred over the last 2 years.	Sighted
Key Process 5: Asset Operations					
Action 17: Establish "Plan Asset Operations" and "Analyse Asset Operations" Processes and a program to address the development of operations Plans for all existing schemes.	Operators may not be referencing operations Plans when undertaking day to day	ON TARGET	July 2009	Template for Water Scheme is completed and being utilised. 1st round of Plans will be completed in June. Templates being developed for Wastewater Catchments, WWTPs and GWTPs. Gen 2 PAO Process under development and expected in July 2009. Integration with "Manage Water Quality" Process under development.	

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	COMMENTS	REVIEWER FEEDBACK
Action 18: Develop operation plans for all schemes	Operators may not be referencing operations Plans when undertaking day to day	ON TARGET	June 2012	1st round of Plans will be complete in June. A program to complete all operation plans will be addressed progressively over a few years. No FTE allocation and no new initiative funding therefore will need to be assessed on a prioritised approach each year.	
Action 19: Place all existing operating Plans and newly developed Plans in AMPS for access by anyone who needs to access them.	Operators may not be referencing operations Plans when undertaking day to day operations.	ON TARGET	June 2010	New Operations Plans are being referenced in AMPS as they are developed.	
Key Process 6: Asset Maintenance					
Action 20: Develop Maintenance Standards for all asset classes. Develop Maintenance plans in conformance with the Maintenance Standards.	Maintenance plans are being loaded into SAP. Not all are aligned with schemes yet	ON TARGET	6 classes complete June 09 7th class by Sept 09 3 more classes to be completed by 09/10	Seven Asset Classes completed to date (08/09). Maintenance Standards for four Asset classes expected to be developed in (09/10. Maintenance Plans are being loaded at progressively by OAM.	

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	COMMENTS	REVIEWER FEEDBACK
Action 24: Develop a process to access and apply information related to failures that may apply at multiple locations.	The possibility of maintenance problems being kept local without statewide recognition needs to be addressed.	ON TARGET	June 2008 for maintenance and June 2009 for operations	BWIP 2 functionality will provide the basis for developing High Failure Rate/ High cost reporting at equipment level using Feedback Codes currently being deployed. Status report not yet received	
Action 26: Work with OAM and SD to adjust the work management practices (which primarily manifest in SD) to achieve activity prioritisation.	Limitations on available funds /resources for maintenance could limit actions possible and a prioritisation method is needed to assist decision making.	ON TARGET	Oct 2009	Plan Asset Maintenance Process is now integrating well with ABP Process to provide a view of "Best Practice" and "Risk Based Funded Plan". Methodology has been developed and deployed for Maintenance Item Prioritisation. Work Order prioritisation under development as part of the Planning & Scheduling Project.	Sighted
Key Process 9: Contingency Planning					
Action 30: See MR&A audit action 2.4.1(ii). Accelerate identification of critical assets under ARA process and ensure all critical assets have suitable contingency planning	Not all critical assets may yet be identified (Refer risk management above)	ON TARGET	June 2011	As part of its due diligence the Corporation is progressively reviewing the management of assets that are most critical to the delivery of service. Regions are currently reviewing the Top 50 most critical assets in each region. As part of the review the adequacy of various aspects, (i.e. condition,	Sighted

ACTIONS	ISSUES	STATUS	TARGET COMPLETION DATE	COMMENTS	REVIEWER FEEDBACK
				risk, preventative maintenance and contingency plans), related to asset performance are being assessed. All aspects are well progressed although resourcing constraints have resulted in slower than anticipated progress in the delivery of contingency plans.	
Action 32: Develop a program to update or provide contingency plans to all critical assets, progressively, over the coming 2 years.	Appropriate contingency plans need to be in place for critical assets	ON TARGET	June 2011	Critical assets identified. An interim contingency plan template sent to operating groups for use. Currently working to identify system for electronic loading of contingency plans. CP guideline draft awaiting endorsement from Legal and Risk Branch. Asset based CP templates have been updated. Critical asset are now listed in SCM and existing CPs have been linked. Action remains to align existing CPs to new format.	
Key Process 12: Asset System Review					
Action 35: The functionality to display an AMP was lost with the creation of AMPS. This is a SAM action to enable TAM to populate the system.	Asset management plan document definition not yet complete	ON TARGET	December 09	Work on project delayed. This work is now being incorporated into AMPS Strategy.	