

PUBLIC REPORT

Controlling Corporation

SunWater Limited

Period to which this report relates

Start 1 July 2008

End 30 June 2009

Part 1 – Information on assessments completed to date

Table 1.1 – Description of the way in which the Corporate Group (or part of it) has carried out its assessments

SunWater conducted assessments on the Dalbeg irrigation system and the Collinsville industrial pipeline system. These systems were selected because of their age or high energy usage. They are representative of the energy used in other SunWater irrigation and industrial water delivery systems.

The aim of the assessments was to identify opportunities to reduce energy consumption. To achieve this SunWater followed an assessment plan that ensured involvement of all key stakeholders in the process. The assessments included:

- Developing assessment plans,
- Involvement of qualified, knowledgeable staff,
- Collection and analysis of data,
- Conducting EEO assessment workshops,
- Conducting detailed energy investigations including development of Energy Mass Balance models, and
- Documenting and communicating the assessment outcomes.

The EEO assessment plans were developed to ensure that all SunWater EEO assessments meet the legislative requirements of the EEO Act, in particular the six key elements of the Assessment Framework.

The implementation of the EEO program has been delayed due to other urgent priorities. An assessment guideline has been developed and the program is currently being reviewed to maximise the value of the program to the organisation and ensure that the prescribed assessments meet legislative requirements.

Table 1.2 – Energy use assessed

Group member and/or business unit and/or key activity and/or site that has had an assessment completed by the end of this reporting period.	Period over which assessment was undertaken ¹	Energy use per annum in GJ ² in the current reporting year
Dalbeg distribution system	July 2006 to December 2008	6,260
Collinsville pipeline	July 2006 to December 2008	10,523
Total energy assessed		16,783
Total energy use of the group in the current reporting year		550,565
Total energy assessed expressed as a percentage of total current energy use		3%

1. This should be the start and finish date (month and year) for the assessment (planned assessment dates were nominated in Table 3.1 of the approved ARS).
2. Energy Bandwidth may only be used if approved in the Assessment and Reporting Schedule.

Part 1 – Information on assessments completed to date (continued)

Table 1.3 – Accuracy of energy use data		
Entity	% achieved	Reasons for not achieving data accuracy to within $\pm 5\%$
Dalbeg distribution system	$\pm 5\%$	
Collinsville pipeline	$\pm 5\%$	

Part 2 - Energy Efficiency Opportunities that have been identified and evaluated

Part 2B - Update of assessments originally reported in previous reporting periods

Name of Group member or business unit or key activity or site: SunWater Limited

Energy use of the entity during the current reporting period

16,783	GJ
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Table 2.3 - Opportunities assessed to an accuracy of $\pm 30\%$ or better

Status of opportunities identified		Number of opportunities	Estimated energy savings per annum by payback period (GJ)			Total estimated energy savings per annum (GJ)
			0 – < 2 years	2 – ≤ 4 years	> 4 years	
Outcomes of assessment*	Total Identified	3	2,063		275	2,338
Business Response*	Under Investigation					
	To be Implemented	2			275	275
	Implementation Commenced	1	2,063			2,063
	Implemented					
	Not to be Implemented					

Note: Refer opportunities 1, 2, and 6.

Name of Group member or business unit or key activity or site: SunWater Limited

Energy use of the entity during the current reporting period

16,783	GJ
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Table 2.4 - Opportunities assessed to an accuracy of worse than $\pm 30\%$

Status of opportunities identified		Number of opportunities	Estimated energy savings per annum by payback period (GJ)			Total estimated energy savings per annum (GJ)
			0 – < 2 years	2 – ≤ 4 years	> 4 years	
Outcomes of assessment*	Total Identified	5			3,137	3,137
Business Response*	Under Investigation	4			3,137	3,137
	To be Implemented					
	Implementation Commenced					
	Implemented					
	Not to be Implemented	1			350	350

Note: Refer opportunities 3, 4, 5, 7 and 8.

Part 2 - Energy Efficiency Opportunities that have been identified and evaluated

Part 2C - Details of at least three significant opportunities found through EEO assessments

Table 2.5 – Description of 3 significant opportunities

Opportunity 1

Dalbeg system – Replacement of dethridge wheel water meters:

There are 52 dethridge wheel meters installed on the Dalbeg distribution system. The dethridge wheel meters have significant error rates with an average under-reading of -15%. SunWater delivers sufficient water into the irrigation system to ensure that customer demands are satisfied according to the reading recorded on individual dethridge wheel meters. This means that SunWater routinely pumps 15% more water than what is ordered by customers with dethridge wheel meters. This over-supply of water is approximately 657 ML per year.

Replacing dethridge wheel meters with new meters that meet the accuracy requirements of the National Framework for Non-Urban Water Metering standards will result in less water needing to be pumped to satisfy customer orders with subsequent savings in electricity usage at pump stations.

The cost to replace 52 dethridge wheel meters on the Dalbeg distribution system is estimated to be \$572,000 and would result in savings of approximately 275 GJ per year with a current value of \$9,624. The payback period is 59 years, but the replacement of the dethridge wheel meters will be completed by 2018 in accordance with the National Framework for Non-Urban Water Metering standards.

Status: To be implemented.

Two Dethridge wheel type meters were replaced with EM meters in the within the last 12 months. Meter replacements within the system have been placed on hold for the immediate future until the National Water Initiative requirements have been finalised by the regulator.

Opportunity 2

SunWater – Improved data collection and monitoring:

During the assessments of the Dalbeg distribution system & Collinsville pipeline system it became apparent that energy data is recorded in different formats and locations in the different SunWater regions.

SunWater is investigating options to implement improved data capture and reporting processes to allow consistent reporting against KPIs and for benchmarking across the asset portfolio.

Status: To be implemented.

A spreadsheet solution has been put together capturing electricity usage invoiced versus water pumped for the BHWSS. As electricity is typically metered at each individual pump station, this spreadsheet provides the ability to trend individual pump station efficiency. The spreadsheet is still in development.

Opportunity 3

Collinsville Pipeline – Pipeline Swabbing:

Build up of scale on the inside of pipelines increases the flow resistance of the system. This results in an increase in the energy consumption requirement to pump water over time. The scale build up in pipelines can be removed by periodically cleaning the inside of the pipeline. This cleaning process is known as swabbing or pigging. By monitoring the energy usage per mega-litre of water pumped, the optimum time to swab the pipeline can be determined. Experience from other pipelines indicate that swabbing the pipeline every 8 to 12 months can potentially reduce energy use by approximately 5% per annum.

To effectively identify the best time to pig the pipeline, an accurate bulk water meter is required at the pump station. A six monthly calibration program has commenced on the Collinsville pump station flow meter.

Based on experience at other pipelines, swabbing the Collinsville pipeline periodically should see annual energy use reduced by approximately 850 GJ with a current savings of \$30,000.

Status: Under investigation

It was determined that the Collinsville pipeline was constructed without the provision to insert or retrieve swabs. Purpose built swab launch and retrieval stations would need to be constructed at strategic locations along the pipeline to facilitate swabbing. There are significant costs associated with the design and construction of these stations, which will impact on the payback period. The approximate cost to design and construct swab pits was estimated to be 70-80k, however a more detailed design and construction cost estimate needs to be undertaken.

Scouring the pipeline through existing scour off takes in the bottom of the pipeline will be investigated. This method will enable sediment to be drawn into the scour when open, however could pose some risks when opening and closing scours that have not been operated for some time.

The method of injecting air into the pipeline creating an atmosphere of water and air that will travel through the pipeline removing silt etc. is also being investigated. No recommendations on this method have been concluded at this stage.

Opportunity 4

Dalbeg system and Collinsville pipeline – Pump Efficiency Testing:

SunWater has 83 pump stations including pump stations on the Dalbeg distribution system and the Collinsville pipeline system. Pump stations are the largest consumers of energy within SunWater. To minimise energy usage at pump stations it is essential that pumps are maintained and operated to ensure optimum pump performance is achieved. SunWater is currently investigating a number of methods to monitor and test pump efficiency on a regular basis. It is expected that this data will assist with planning for pump overhauls and for improving the operational utilisation of the pumps.

The expected savings in energy consumption has not been quantified.

Status: Under investigation

Equipment has been purchased to help facilitate pump efficiency testing in BHWSS. A procedure and schedule of testing has not been developed yet.

Opportunity 5

Dalbeg system – Dalbeg B Pump Replacement:

Dalbeg B pump station has two submersible pumps that are operating at 70% efficiency. There are pumps available on market with higher efficiencies of up to 80%. Replacement of the submersible pumps would save 350 GJ at a value of \$12,733 annually. But replacement of the Dalbeg B pumps would cost approximately \$227,000 which equates to a pay back period of 17 years.

Based on the pay back period, the replacement of the Dalbeg B pumps will not be implemented. However, replacement will be reviewed as the pumps approach their next overhaul.

Status: Not to be implemented.

Project is to be included in the 5 year refurbishment plan.

Opportunity 6

Dalbeg system – Line channels or replace channels with pipeline:

The System Leakage management Plan (SLMP) for the Dalbeg system includes an annual leakage of 10,928 ML (2002/03). This figure is the total of quantifiable losses plus the inferred system leakage. The quantifiable losses are known losses and are approximately 5,830 ML per year. Of the quantifiable losses, operational losses from channel overflows are the most significant contributing factor with overflow losses in the order of 5,475 ML per year. A further 80 ML per year on average is lost to evaporation.

The inferred leakage in the Dalbeg system has been reduced from 5,098 ML in 2002/03 to just 160 ML in 2007/08. A saving of 97% of the inferred leakage. This reduction has been achieved by replacing some lateral channels with pipelines, progressively lining the main channel and replacing dethridge wheel meters with electromagnetic meters. Controlling the system leakage has reduced the annual pumping requirement by 4,938 ML since 2002/03 which represents a saving of 2,063 GJ per year at a current value of \$72,319.

Status: Implementation commenced.

The modernisation investigation identified some potential cost benefit to converting Channel 1 in the Dalbeg system to a pipeline however there has been no budget allocated to these works to date.

Opportunity 7

Dalbeg system – Improvements in operational management:

The System Leakage management Plan (SLMP) for the Dalbeg system includes annual quantifiable losses of 5,830 ML per year. Of these losses, operational losses from channel overflows are the most significant contributing factor with overflow losses in the order of 5,475 ML per year.

A contributing factor to system overflows is pumping an over-supply of water into channels to ensure an adequate supply of water is delivered to satisfy orders placed by customers. The over-supply of water can lead to downstream overflows if customers do not draw out the full amount of water ordered.

It may be possible to work with local water customers to develop a more efficient operational profile for the Dalbeg system to reduce over-supplying water in channels. The amount of reduction in channel overflows is difficult to quantify, but any reduction in the amount of water pumped into the Dalbeg system will lead to energy savings.

Status: Under investigation.



Opportunity 8

Dalbeg system – Total System Control:

The System Leakage management Plan (SLMP) for the Dalbeg system (2002/07) includes annual quantifiable losses of 5,830 ML per year. Of these losses, operational losses from channel overflows are the most significant contributing factor with overflow losses in the order of 5,475 ML per year.

Installing total channel control in the Dalbeg system will improve operational efficiency of the system by reducing the need to over-fill channels. Total channel has the potential to reduce the overflow losses from 5,475 ML per year to almost zero. Removing the need to pump 5,475 ML reduces annual energy usage by 2,287 GJ with a value of \$80,184.


The capital cost to install total channel control is under investigation.

Status: Under investigation.

Part 4 - Declaration

Table 4.1 - Declaration of accuracy and compliance (mandatory information)

The information included in this report will be reviewed and noted by the board of directors and is to the best of my knowledge, correct and in accordance with the *Energy Efficiency Opportunities Act 2006* and *Energy Efficiency Opportunities Regulations 2006*.

 (G K WHITE)
Chief Executive Officer
Date 14 JANUARY 2010.