



Australian Government
Department of Resources, Energy and Tourism

Energy Efficiency
Opportunities



ENERGY EFFICIENCY OPPORTUNITIES

FIRST PUBLIC REPORT

JULY 2006 TO DECEMBER 2008

FIRST PUBLIC REPORT TEMPLATE

Controlling Corporation

SunWater Limited

Period to which this report relates

Start 01 July 2006

End 31 December 2008

Part 1 - Summary of assessments conducted thus far

Table 1.1 - Description of the way in which the corporation has carried out its assessments and over what period was each assessment taken. A statement saying that the intent and key requirements of the Energy Efficiency Opportunities legislation have been met must be made.

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.

Table 1.2 - Group member/business unit/key activity/site that have been assessed	Energy use per annum in the year the assessment is completed *	Energy data accuracy (if not within $\pm 5\%$) **	Reasons for not achieving data accuracy to within $\pm 5\%$ **
Dalbeg distribution system	6,260 GJ	$\pm 5\%$	Not applicable
Collinsville pipeline	10,523GJ	$\pm 5\%$	Not applicable
Total	16,783 GJ		
Total as a percentage of total energy use of the group covered by this report	3%***		

* Energy Bandwidth may only be used if approved in the Assessment and Reporting Schedule

** Data accuracy not within $\pm 5\%$ can only be included if approved in the Assessment and Reporting Schedule

Part 2 - Outcomes of and business response to opportunities that have been identified and evaluated for each group member, business unit, key activity or site assessed

Group member/business unit/key activity/site >0.5 PJ name: Dalbeg distribution system and Collinsville pipeline

Table 1.3 Status of Opportunities		Number of Opportunities	Estimated energy savings per annum by payback period (GJ)			Total estimated energy savings per annum (GJ)	*Accuracy range (%)
			0 – < 2 years	2 – ≤ 4 years	> 4 years		
Outcomes of assessment	Identified (accuracy ≤ ±30%)	3	2,063		275	2,338	≤ ±30%
	Identified (accuracy > ±30%)	5			3,137	3,137	> ±30%
	**Total Identified	8	2,063		3,412	5,475	
***Business Response	Under Investigation	4			3,137	3,137	> ±30%
	To be Implemented	2			275	275	≤ ±30%
	Implementation Commenced	1	2,063			2,063	≤ ±30%
	Implemented						
	Not to be Implemented	1			350	350	> ±30%

*The accuracy range for projected or actual costs, benefits and energy savings.

**You must ensure that this row is the sum of the two rows above it.

*** The data contained in each row of the business response area must total to the data contained in the 'Total Identified' row.

Note: An opportunity is any potential change to a system, activity or piece of equipment that:

- is identified during an EEO assessment;
- is consistent with legal requirements such as OHS, and
- may result in energy savings projects with payback periods of 4 years or less.

Details of at least three significant opportunities found through EEO assessments

Table 1.4

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

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

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.

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

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 in current 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.

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

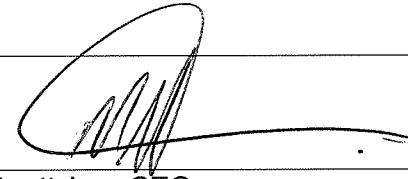
Part 3 - Voluntary Contextual Information

Reporting corporations may supply additional information that provides more context to the public report. Such information may include:

- During the period 2000-2008 energy savings increasing progressively to 2,063 GJ per year were achieved on the Dalbeg system by re-lining channels and replacing some lateral channels with pipelines.
- A number of opportunities with payback periods of greater than four years have been identified and are under investigation or being implemented.

Part 4 - Declaration

The information included in this report has been 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*.



Peter Boettcher, CEO