Werris Creek Coal

Energy Savings Action Plan

June 2010

Prepared for

NSW Department of Planning

Version Number		By	Approved by	Date
1.	First draft for approval	D Cooke		15 June 2010
2.	Final	D Cooke	A Wright	28 June 2010
3.				

Prepared by Denis Cooke & Associates Pty Limited
PO Box 4741 North Rocks NSW 2151
Tel: 02 9871 6641
Web: www.decoa.com.au
June 2010

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1.0 Executive Summary

This document has been prepared by Whitehaven Coal Mining Pty Ltd (WMPL) for the NSW Department of Planning (DoP) with assistance from an external consultant.

The purpose of this document is to meet Condition 58 of the Consolidated Development Consent (DA-172-7-2004 MOD5) issued on 19 September 2010 which states:

GREENHOUSE GAS EMISSIONS
58. The Applicant shall: shall implement an Energy Savings Action Plan for the project to the satisfaction of the Director-General. This plan must:

a) be prepared in accordance with the Guidelines for Energy Savings Action Plans (DEUS, 2005), or its latest version;
b) include consideration of energy use by mobile equipment and investigate ways to reduce greenhouse gas emissions generated by the development; including the use of mains electric power to operate equipment associated with the coal processing plant and the rail load-out facility; and
c) be submitted to the Director-General for approval prior to 30 June 2010; and
d) include a program to monitor the effectiveness of measures to reduce energy use on site.

This Energy Savings Action Plan applies to Werris Creek Coal as approved with contributions from the following Werris Creek Project staff members:

Mr Mick Post – Project Manager, Werris Creek Coal.
Mr Peter Easy – Coal Processing Manager, Werris Creek Coal.
Mr Craig Allgayer – Maintenance Superintendent, Werris Creek Coal.
Mr Andrew Wright –Environmental Officer, Werris Creek Coal.

Werris Creek Coal is an existing open cut mine that commenced operations in 2005. The project comprises an open cut coal mine using excavators and dump trucks, a coal stockpile and crushing area and site facilities to service the mine. A rail load-out facility has been constructed at the northern end of the lease. A purpose built private haul road within the lease allows for the coal to be transported from the mine site crusher and ROM stockpiles to the train load-out coal stockpiles. The coal is loaded onto rail for transport to Newcastle and export.

With the latest development consent approval, the mine may produce up to 2.0 million tonnes of coal per year.

The first coal production occurred in August 2005.

Opportunities to reduce and minimise energy usage across the site are key to the design and engineering considerations for the mine as set out in the document: The Energy Guide: Whitehaven Coal Mining Pty Ltd – Werris Creek Coal, Energy Management and Greenhouse Principles – Management Guide.

This Action Plan has been prepared in accordance with the *Guidelines for Energy Savings Action Plans* produced by DEUS in October 2005 and associated Guide Notes and includes the following sections as set out in the Guide Notes:

- Basic Information About the Site and its Operation;
- Past Energy Usage and projected Future Usage;
- Integrating the Plan;

- Baseline Energy Usage Data;
- Management Review;
- Provisional Technical Review (Energy) including an assessment of potential energy savings measures that could be implemented; and
- Summary and Recommendations.

The energy savings measures listed in this report provide a “snapshot” of the activities currently being investigated. As with all cost reduction activities, this process is continuous and will become embedded in Werris Creek’s operating principles and procedures. New projects will be identified as technology changes and as older opportunities are revisited under circumstance where cost benefit ratios change.

Please contact site management if you have any questions or comments associated with this document.

2.0 Introduction

This document covering Werris Creek Coal has been prepared by Whitehaven Coal Mining Pty Ltd, part of the Whitehaven group of companies, for the New South Wales Department of Planning. The purpose of this document is to meet Condition 58 of the Consolidated Development Consent (DA-172-7-2004 MOD5) issued on 19 September 2010 which requires Whitehaven Coal Mining Pty Ltd (Werris Creek Coal) to provide the Department of Planning with an Energy Savings Action Plan (ESAP).

The Plan has been prepared in accordance with the *Guidelines for Energy Savings Action Plans* produced by DEUS in October 2005.

2.1 Site Description and Layout

Werris Creek Coal Mine is located approximately 4km south of Werris Creek and 11km north-northwest of Quirindi in central northern New South Wales. (See Figure 1). The Mine Site covers an area of approximately 679 ha and is centred on the "Narrawolga" property, and incorporates parts of the adjoining "Eurunderee" and "Cintra" properties.

Within the project area, lies an isolated outlier of coal-bearing strata preserved within a syncline about 2.5 km by 1 km wide with the north end of the syncline previously mined by underground methods. The resource has been identified as open cut coal reserves in nine separate seams; Black, A, B, C, D, E, F, F(r r) & G specifically with 9.8 million tonnes (identified), 6.5 million tonnes of indicated reserves and 3.3 million tonnes of inferred reserves which are independent from previously mined underground area. The coal resource of six major seams is low ash, low sulphur, bituminous, thermal coal suitable to be mined as a raw coal for export.

The mine site covers an area that comprises extensively cleared land that has been used for mixed grazing and cropping purposes. The facilities and components associated with the project include:

- Open cut mining over an area of about 200 ha using excavator, trucks and scrapers will be undertaken for the removal of soil and rock material above and within the coal seams, coal extraction, progressive backfilling and rehabilitation of the mined-out areas;
- Annual coal production that will increase from an initial level of approximately 1.0 Mtpa to an annual rate of 1.8 to 2.0 Mtpa;
- Raw coal crushed, stockpiled and blended if necessary prior to transport by private haul road to the rail loud-out facility;
- On-site processing is confined to crushing and screening (no washing);
- Infrastructure including administration employee amenities services and related facilities;
- Coal haulage by private road to the Rail Load-out Facility at the northern most end of the lease area. The sealed private coal haul road is approximately 3 km long from the mine crushers and sizers directly to the Rail Load-out Facility;
- Maximum production will require 260 truckloads of coal per day;
- Current mine life until approximately 2012.

The project layout is shown in Figure 2.

Figure 1 - Werris Creek Coal Mine Location

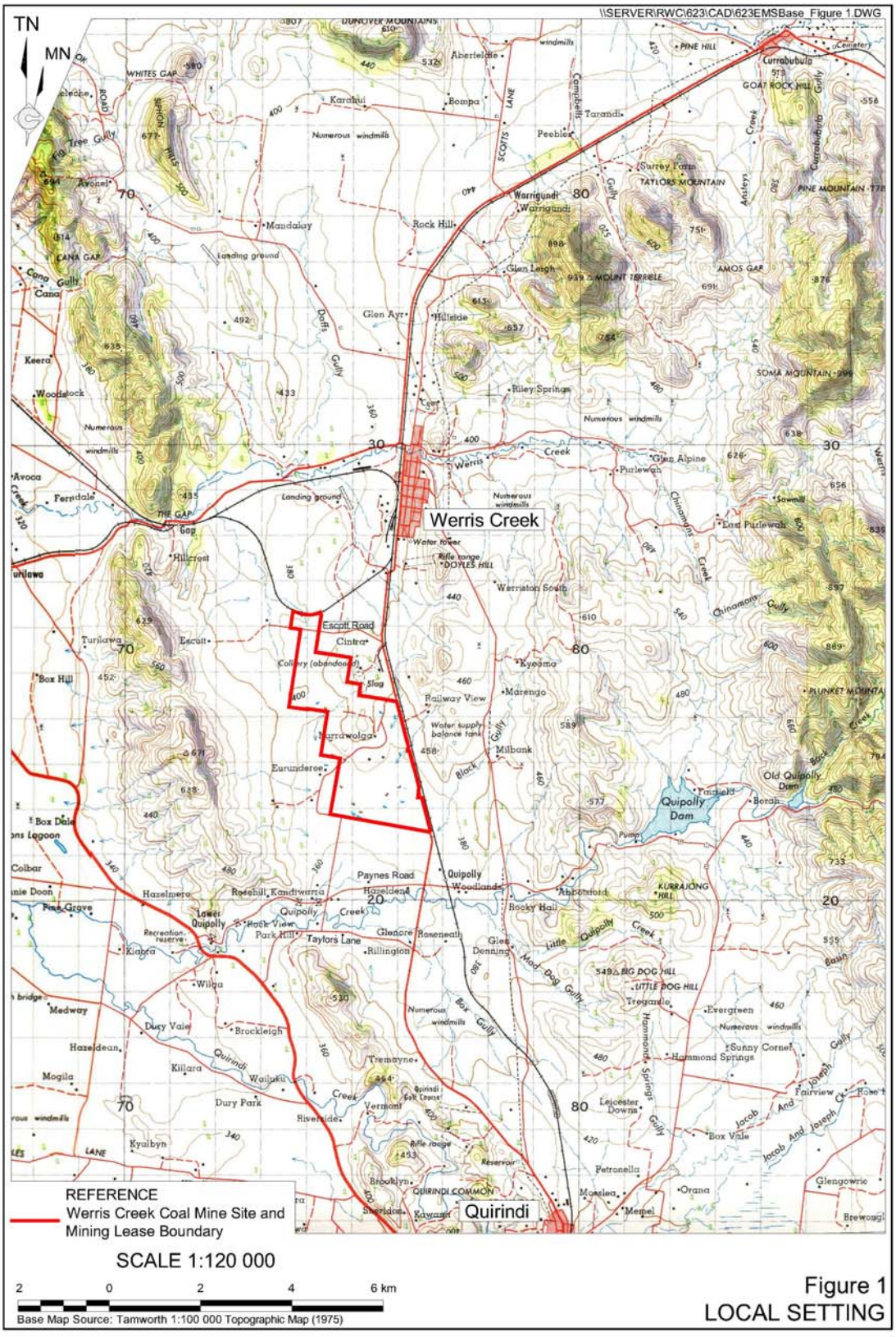
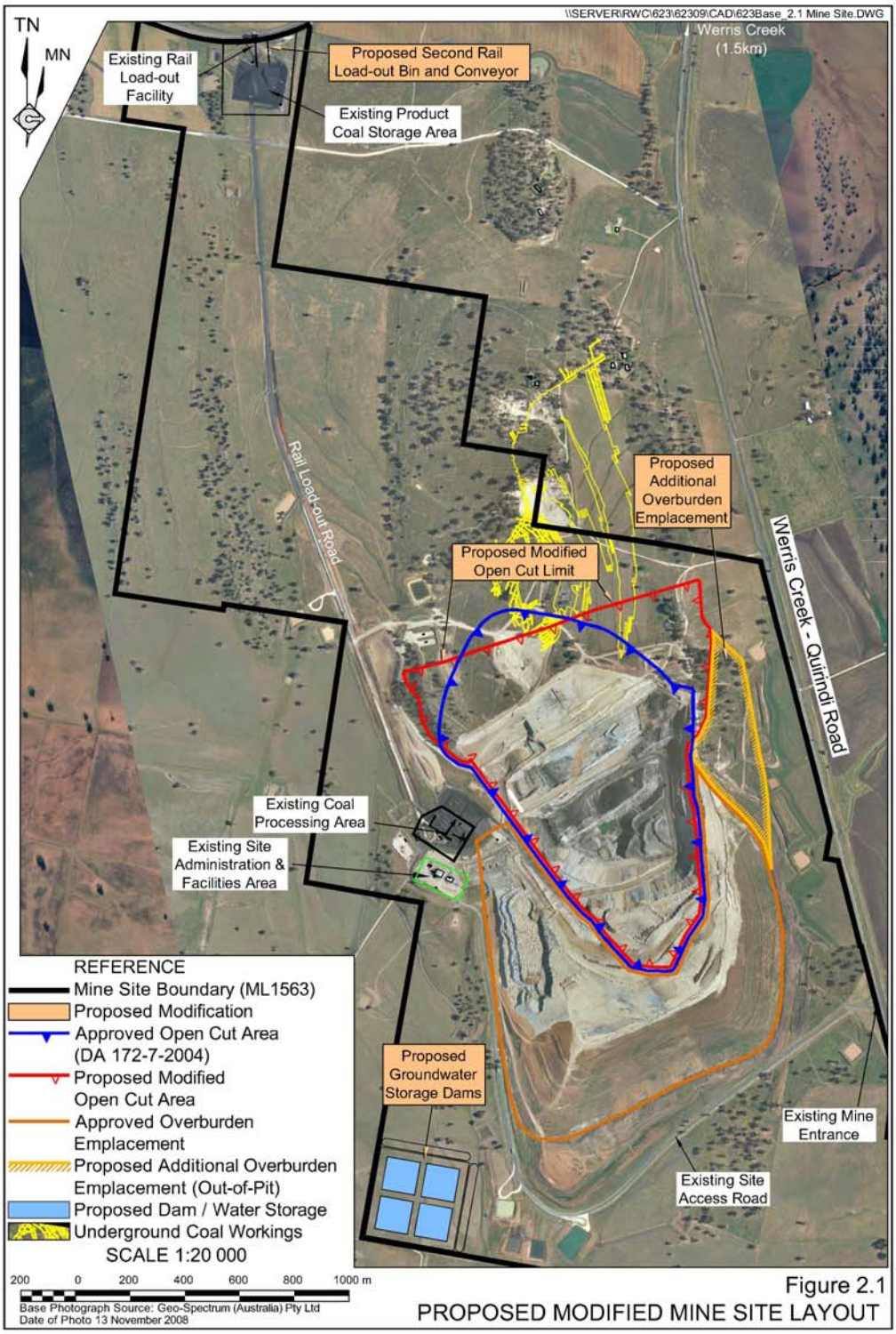


Figure 2 - Werris Creek Project Layout



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2.2 Functional Areas

The functional areas on the mine site are as follows:

2.2.1 Coal Processing Area

The equipment and infrastructure for the coal processing area is summarised in Table 1 below.

Table 1 - Coal Processing Options

Option 1 – Processing Plant
ROM coal pad
Coal loading hopper
Crushers
100t product bin
Conveyor
Product coal stockpile area

2.2.2 Site Services Area

Figure 2 shows the site services established for the project located adjacent to the incoming access road which include the following components:

- Mine office;
- Toilet and ablution facilities;
- Crib hut;
- Hardstand and lay down area;
- Self-bunded fuel tank;
- Waste oil area;
- First aid building;
- Maintenance workshop, wash bay; and
- Light vehicle parking facilities.

2.2.2 Rail Load-out Facility

The rail load-out facility comprises a coal loading hopper and conveyor drive that delivers the product coal via a 100m enclosed conveyor to a 1,000t capacity train loading bin above the Werris Creek rail siding.

2.3 Key Statistics

Some key statistics for the mine are listed below:

- Coal Seams: nine separate seams; Black, A, B, C, D, E, F, F(r r) & G with six at depths suitable for open cut mining.
- Upper limit of overburden to coal stripping ratio: 7.5:1 (bank cubic metres of overburden: tonnes of coal).
- Coal Product: low ash, low sulphur, bituminous, thermal coal suitable for export.
- Operating hours:
    - Mining Operations: 2 shifts per day, five days per week + Saturday day shift only.
    - Maintenance and Train Loading Activities are 24 hours per day, seven days per week as required.
- Employment:
    - Operations: 100 persons.
- Internal truck movement: 260 per day (at maximum production).

2.4 Main Equipment

The main equipment used at the mine is listed in Table 2 below:

Table 2 - Equipment List

Item	No. on Site	Function	Duration of Use
Excavator (220t / 350t)	2	Overburden Excavation/Loading	Full Time
Excavator (125t / 220t)	3	Overburden/Coal Excavation/Loading	Full Time
Excavator (37t)	1	High wall Maintenance & Other Production	Full Time
Haul trucks	15	Overburden/Coal Haulage	Full Time
Bulldozer - Cat D11	2	Overburden Prime Push, Overburden/Coal Rip/Push Up, Final Landform Development	Full Time
Bulldozer - Cat D10	2	Clearing, Overburden/Coal Rip/Push Up, Overburden Emplacement/Road Maintenance, Final Landform Development	Full Time
Bulldozer - Cat D9	2	Product Coal Stockpile/Train Load Out	Full Time
Grader	1	Road/Overburden Emplacement Maintenance	Full Time
Fuel/Service Truck	1	Equipment Refuelling/Servicing	Full Time
Scraper	6	Campaign Topsoil/Subsoil Removal and Replacement	Campaign
Drill Rig	6	Blast hole Drilling	Full Time
Explosives Truck	1	Campaign Loading Blast holes	Campaign
Front End Loader	3	Screening Plant/Product Coal Loading/Stemming	Full Time
Crushing and Screening Plant	1	Coal Size Reduction and Screening	Full Time
Diesel Powered Lighting Tower	7	Lighting for Work After Nightfall	Full Time (at night)
Water Carts	3	Dust Suppression	Full Time

3.0 Energy Savings Initiatives at the Site

Energy initiatives are a central part of the management strategy in designing, constructing and operating Werris Creek Coal.

A key aspect of the management strategy has been the preparation of the site specific document titled:

The Energy Guide: Whitehaven Coal Mining Pty Limited – Werris Creek Coal - Energy Management & Greenhouse Principles – Management Guide (referred to as the Energy Guide).

Sections from the document relevant to this development are reproduced in Section 3.1 below.

3.1 Energy Management & Greenhouse Principles – Management Guide

3.1.1 Preamble

These energy and greenhouse guiding principles have been adapted from the Green Guide developed for the Narrabri Coal Operations Project, also part of the Whitehaven Coal Mining Group. This document has been customised to make it relevant for Werris Creek Coal.

The purpose of these guiding principles is to ensure that Werris Creek Coal achieves excellence in energy efficiency in all operational areas. Werris Creek Coal as part of Whitehaven Coal Mining Limited is committed to the principles embodied in the former Greenhouse Challenge Plus Program and will be implementing energy monitoring and management processes as a key component of its Energy Savings and Greenhouse Management Strategies.

These guidelines have been prepared to ensure that the facilities at Whitehaven Coal Mining‘s Werris Creek Coal are reviewed and if economically feasible upgraded so that they are best practice in terms of their energy efficiency performance. The guidelines are not intended to take responsibility away from any designers in their tasks. If, in the opinion of the designers, sections or parts of these guidelines conflict with design requirements for operational reasons (or other reasons), the differences are to be brought to the attention of Whitehaven Coal Mining management and the differences resolved.

Under no circumstances may these guidelines be used as an excuse for a faulty or under-designed plant.

3.1.2 General

All new equipment and facilities shall be purchased and/or designed using energy efficient best practice.
All purchased equipment and plant shall be specified to achieve the most efficient energy usage over the expected life of the equipment and plant. Consideration shall be given to whole of life costing techniques in the evaluation and selection process.

All plant designs shall incorporate the latest technologies in energy efficiency which shall be demonstrated to the satisfaction of Whitehaven Coal Mining or their representative.

3.1.3 Air Compressors

Portable air compressors should be an appropriate size for the required task. Care shall be taken in locating air compressors to ensure that they are positioned in a naturally clean environment away from any source of heat or direct sunlight.

Air compressors should be turned off when not in use for extended periods of time.

Scheduled inspections and maintenance should be undertaken to identify any issues such as air leaks.

3.1.4 Building Air Conditioning

Air conditioning systems shall use environmentally friendly refrigerants. Systems shall be efficient in their design, include modern energy efficient controls and be turned off when not needed.

3.1.5 Buildings

Transportable buildings are used at Werris Creek Coal. The buildings have been located in an area with no natural shade due to project requirements.

A more thorough investigation into insulation and building location should be undertaken if more permanent buildings are proposed.

3.1.6 Fuel Efficient Diesel Engines

Fuel efficiency should be considered when purchasing diesel engines. Personnel should request engine specifications from the supplier prior to purchase. These specifications should include expected fuel efficiency and are to be compared with specifications for other similar engines.

All diesel engines shall be maintained on a regular basis (as per manufacturer's recommendations and site experience) to ensure efficient operation. Diesel engines should be shut down when not in use (where appropriate) to reduce fuel consumption.

3.1.7 Lighting Systems

Lighting systems shall utilise high efficiency light fittings, where practicable. Lighting systems employing natural light shall be used wherever practicable.

Mobile external security lighting shall consist of sodium vapour fittings.

Lighting shall be turned off when not in use (except lighting used for safety and security reasons). Lighting should be fitted with daylight sensors where possible. All mobile lighting plants shall be fitted with day/night sensors and /or programmable timers to ensure that the plants are turned off when not required.

3.1.8 Pumps

Pumps shall be properly sized for the duty with consideration given to static head pressures, dynamic head pressures and volume flows. Within these parameters, pumps shall operate as close as possible to the point of maximum efficiency. High efficiency impellers shall be used where appropriate. Pumps shall be fitted with flow sensors to shut down the pumps in the absence of liquid flow.

3.1.9 Equipment Operation and Upgrades

Where appropriate, all equipment shall be shut down when not in use for long periods. Equipment shall be fitted with automatic cut-off systems.

Operator training is essential to ensure the efficient operation and maintenance of equipment.

Opportunities should be identified on an ongoing basis to upgrade or replace equipment to improve efficiency, where cost effective.

3.1.10 Mining

The mine shall be designed to ensure that the following objectives are achieved:

Movement of Overburden
The overburden associated with the open cut shall be moved the minimum distance to its final location in a single process without re-handling. At the end of mine, the overburden shall be reshaped to Mining Operation Plan (MOP) requirements.

Mining Efficiency
Operations shall be designed to minimise the loss of coal in operations and also to maximise the recovery of exposed coal.

Road grades shall not exceed 10 % and hauling distances shall be minimised to reduce diesel consumption.

Mine Plan
The mine plan shall optimise ‘flat hauling’, i.e., the haulage of coal or waste as far as possible on the flat.

3.1.11 Water

The distances over which water is pumped shall be kept to a minimum to reduce pumping requirements. Gravity assist shall be utilised wherever possible.

4.0 Introduction to Energy Savings Opportunities at the Site

Werris Creek Coal has developed additional projects to improve energy usage and energy efficiencies across the site. It is anticipated that this programme will result in both benefits to the environment and cost savings for our business.

Therefore the objectives of this Action Plan are to:

- Comply with Department of Planning Development Consent DA-172-7-2004 MOD5 requirements for the production of an Energy Savings Action Plan;
- Identify actions that have the potential to help reduce the amount of energy used at Werris Creek Coal;
- Implement financially viable opportunities identified above; and
- Lower the greenhouse gas emissions footprint for our activities.

5.0 Integration with Existing Business Operations

Energy efficiency is of great interest to Whitehaven Coal Mining as it is a key component and expense in our mining processes. It is planned to produce energy performance targets to encourage a reduction in the energy used on site through a process of continual improvement.

It is intended to utilise the energy data that will be available from the fuel dispensing records on site to track energy usage by area and function and combine that information with data on coal production to produce relevant energy performance indicators.

It is proposed to separately monitor energy usage by major items of plant as listed in the main equipment shown in Section 2.4.

Also, the procedures and controls identified in this Action Plan will be incorporated into our standard operating procedures to ensure implementation across site.

6.0 Estimated Energy Baseline Data

Tables 3, 4, 5 and 6 below provide actual data on energy usage at Werris Creek Coal for the first full three years of operations.

The first coal was produced in August 2005. Energy performance indicators have been derived from the run of mine (ROM) coal produced as well as the total equivalent overburden movement (bank cubic metres total equivalent movement – BCM TEM) as shown in the tables below.

The information provided in these tables is based on the templates provided in the DEUS *Guidelines for Energy Savings Action Plans*.

Table 3 - Baseline Energy Statistics – Year 2006/2007

Start Date	1 July, 2006	
End Date	30 June, 2007	
Baseline Energy Use (Werris Creek Coal)	268,329 GJ	
Greenhouse Emissions - Scopes 2 and 3	21,541 tonnes CO_2-e	
Is baseline representative of normal energy use?	Yes	Yes
Business Activity Indicator	tonnes ROM produced	BCM TEM
Quantity of Site Business Activity (tonnes)	1,326,707	5,653,503
Baseline Energy Key Performance Indicator (KPI)	202.3	36.1
Baseline KPI units	MJ/tonne ROM	MJ/BCM TEM
Summer Peak Electrical (kVA)	N/A	
Winter Peak Electrical (kVA)	N/A	

Table 4 - Baseline Energy Statistics – Year 2007/2008

Start Date	1 July, 2007	
End Date	30 June, 2008	
Baseline Energy Use (Werris Creek Coal)	300,749 GJ	
Greenhouse Emissions - Scopes 2 and 3	23,383 tonnes CO_2-e	
Is baseline representative of normal energy use?	Yes	Yes
Business Activity Indicator	tonnes ROM produced	BCM TEM
Quantity of Site Business Activity (tonnes)	1,211,020	8,097,278
Baseline Energy Key Performance Indicator (KPI)	248.3	37.9
Baseline KPI units	MJ/tonne ROM	MJ/BCM TEM
Summer Peak Electrical (kVA)	N/A	
Winter Peak Electrical (kVA)	N/A	

Table 5 - Baseline Energy Statistics – Year 2008/2009

Start Date	1 July, 2008	
End Date	30 June, 2009	
Baseline Energy Use (Werris Creek Coal)	265,972 GJ	
Greenhouse Emissions - Scopes 2 and 3	20,623 tonnes CO_2-e	
Is baseline representative of normal energy use?	Yes	Yes
Business Activity Indicator	tonnes ROM produced	BCM TEM
Quantity of Site Business Activity (tonnes)	1,082,835	6,821,677
Baseline Energy Key Performance Indicator (KPI)	245.1	36.1
Baseline KPI units	MJ/tonne ROM	MJ/BCM TEM
Summer Peak Electrical (kVA)	N/A	
Winter Peak Electrical (kVA)	N/A	

Table 6 - Baseline Energy Statistics – Year 2009/2010 (Projected

Start Date	1 July, 2009	
End Date	30 June, 2010	
Baseline Energy Use (Werris Creek Coal)	362,093 GJ	
Greenhouse Emissions - Scopes 2 and 3	28,032 tonnes CO_2-e	
Is baseline representative of normal energy use?	Yes	Yes
Business Activity Indicator	tonnes ROM produced	BCM TEM
Quantity of Site Business Activity (tonnes)	1,227,710	10,304,457
Baseline Energy Key Performance Indicator (KPI)	294.9	35.1
Baseline KPI units	MJ/tonne ROM	MJ/BCM TEM
Summer Peak Electrical (kVA)	N/A	
Winter Peak Electrical (kVA)	N/A	

It is noted that the energy performance of this mine is dependent on many factors the main ones of which include stripping ratios and material and coal haulage distances. In the main, the energy performance at Werris Creek Coal is highly dependent on the stripping ratio, other factors remaining constant. Thus it is to be expected that the per unit energy performance at the site will vary with the stripping ratio. Nevertheless, the KPIs in the above tables provide useful indicators to the efficient operation of the mine site.

7.0 Energy Management Review

7.1 Energy Management Review Process

The Energy Management Review was initially undertaken on site at Werris Creek and discussed in a meeting with the following staff:

- Mr Mick Post – Project Manager, Werris Creek Coal.
- Mr Peter Easy – Coal Processing Manager, Werris Creek Coal.
- Mr Craig Allgayer – Maintenance Superintendent, Werris Creek Coal.
- Mr Andrew Wright –Environmental Officer, Werris Creek Coal.
- Mr Denis Cooke – Consultant, Managing Director, Denis Cooke & Associates Pty Ltd.

The purpose of the meeting was to inform all present about the ESAP process and to ensure that the proposed actions to improve energy use are supported by senior management.

7.2 Findings of the Energy Management Review

Table 7 below summarises the findings from the Energy Management Review and is based on the template provided in the DEUS *Guidelines for Energy Savings Action Plans*. It represents the current position with these nominated areas of responsibility and provides a clear focus of areas for development and improvement.

Table 7 - Management Review

Area	Review Area	Rating				
		Low	Moderate	Minimum Sustainable	Industry Leader	Best Practice
A	Senior management commitment					
B	Understanding of energy savings potential					
C	Energy targets and key performance indicators					
D	Energy metering and monitoring					
E	Energy management reporting					
F	Energy supply management					
G	Operating and maintenance procedures					
H	Accountabilities for energy management					
I	Training and awareness procedures					
J	Compliance with legal and / or regulatory requirements					

7.3 Management Actions to Improve Energy Management

Table 8 below summarises the actions we have implemented or will implement to allow the management of energy usage across the Mine Site. The information presented in this table is based on the templates provided in the DEUS *Guidelines for Energy Savings Action Plans.*

Table 8 - Management Actions

Item No.	Management Action	Planned Responsibility	Planned Completion Date
1	Assign responsibilities for energy use reporting.	Project Manager – Environmental Officer	Complete
2	Generate monthly reports of site energy use.	Project Manager – Environmental Officer	Ongoing
3	Create energy target (when appropriate) and review during the annual ESAP update	Project Manager	During annual ESAP review
4	Monitor and report on the Key Performance Indicator for energy use across the site.	Environmental Officer	During annual ESAP review

7.4 Energy Review and Energy Projects Brainstorming Session

A meeting will be conducted in approximately 12 months (in line with the initial ESAP review) to assess progress against the Energy Guide and this ESAP.

The meeting will consider any potential energy projects for inclusion in the Energy Savings Action Plan. This review process will be conducted in a brainstorming fashion to ensure that all possibilities are considered fully and without criticism.

This approach is considered suitable given the nature of the site operations, i.e., a small operation run with basic infrastructure and minimal equipment. At that time it is considered that further operational experience will dictate where improvements in energy efficiency may be made.

The outcome from the meeting, and any other energy reviews, will be listed in future ESAP reports.

8.0 Energy Usage Technical Review and Savings Measures

8.1 Energy Usage Technical Review Methodology

The energy usage technical review was undertaken as a broad overview of the functional areas across the mine site. In this context, the review considered the estimated loads and the likely outcome as a result of applying the guiding principles reproduced in this report under Section 3.

Mr Denis Cooke of Denis Cooke & Associates Pty. Limited was engaged by Whitehaven Coal Mining Pty Limited to assist with this task. On site he worked closely in association with the following staff:

- Mr Mick Post – Project Manager, Werris Creek Coal.
- Mr Peter Easy – Coal Processing Manager, Werris Creek Coal.
- Mr Craig Allgayer – Maintenance Superintendent, Werris Creek Coal.
- Mr Andrew Wright –Environmental Officer, Werris Creek Coal.
- Other managers.

8.2 Energy Data

The consultant made available broad data on energy usage for many coal mine sites which was used in the assessment process to confirm that the estimated energy requirements for the site are reasonable.

The ongoing energy performance data will be reviewed against these benchmarks, particularly those of the other Whitehaven coal mines: Sunnyside and Rocglen.

8.3 Functional Areas Assessed during the Review

The estimated energy usage for the mine site was determined by evaluating separately each of the following functional areas:

Coal Processing Area which includes

- ROM coal pad;
- Coal loading hopper;
- Crushers;
- Coal product bin;
- Conveyor;
- Product coal stockpile area; and
- Fuel storage area.

Site Services Area which includes

- Mine office;
- Toilet and ablution facilities;
- Crib hut;
- Hardstand and lay down area;
- Self-bunded fuel bay;
- Waste oil area;

- First aid building;
- Maintenance workshop, wash bay; and
- Light vehicle parking facilities.

It is noted that this mine is small and compact and that most energy use on site will be automotive diesel oil. Given the nature of the operations, the most effective way in managing and minimising energy usage will be to ensure that equipment is switched off when not required.

8.4 Summary of Site and Estimated Energy Usage and Costs

The following tables show the estimated energy usage and costs for the mine site for the next three years based on the present energy performance and projected coal production and overburden movement.

Table 9 - Estimated Site Energy Usage and Costs Year to June 2010

Energy Type	Use in Financial Year 2009/10	GJ Equivalent	Costs
Diesel	9,286,890 litres	358,477	$6,990,381
Electricity	1,004,219 kWh	3,615	$249,258
	Total for period	362,092	$7,239,639

Notes:
1. Diesel costs estimated at $1.15 per litre excise free.

Table 10 - Estimated Site Energy Usage and Costs Year to June 2011

Energy Type	Use in Financial Year 2010/11	GJ Equivalent	Costs
Diesel	11,346,710 litres	437,983	$9,855,753
Electricity	1,226,941 kWh	4,417	$425,674
	Total for period	442,400	$10,281,485

Notes:
1. Diesel costs estimated at $1.25 per litre excise free.
2. Electricity costs estimated at a 40% increase in cost over 2009/2010 costs

Table 11 - Estimated Site Energy Usage and Costs Year to June 2012

Energy Type	Use in Financial Year 2011/12	GJ Equivalent	Costs
Diesel	11,346,710 litres	437,983	$11,557,759
Electricity	1,226,941 kWh	4,417	$486,484
	Total for period	442,400	$12,044,310

Notes:
1. Diesel costs estimated at $1.40 per litre excise free.
2. Electricity costs estimated at a 60% increase in cost over 2009/2010 costs.

8.5 Major Energy Using Equipment

The mine site is small and compact and will contain basic machinery for mining purposes. Table 12 lists the major equipment used at Werris Creek.

Table 12 - Energy Using Equipment

Functional Area for Electricity Usage	Electricity Using Equipment	~kW	Operating and Maintenance Procedures	Control Systems	Cleaning Procedures	Normal Working Hours	Start-up and Shut-down Procedures
Coal Processing Area	Coal Crusher	tba	Scheduled maintenance, operator monitoring.	Manual, operator training	N/A	Weekdays - 0700 – 0400, Sat – 0700 - 1400	Manual
	Coal Conveyor	tba	Scheduled maintenance, operator monitoring.	Manual, operator training	N/A	Weekdays - 0700 – 0400, Sat – 0700 - 1400	Manual
Site Services Area	Mine office, toilet and ablution facilities, crib hut, first aid building, workshop	100	Scheduled maintenance, operator monitoring.	Manual, operator training	N/A	Maximum 24 hours, 7 days a week but generally less than this	Manual

8.6 Site Energy Balance

Figures 3 to 4 illustrate the energy balance for the site for the years 2008/2009 and 2009/2010.

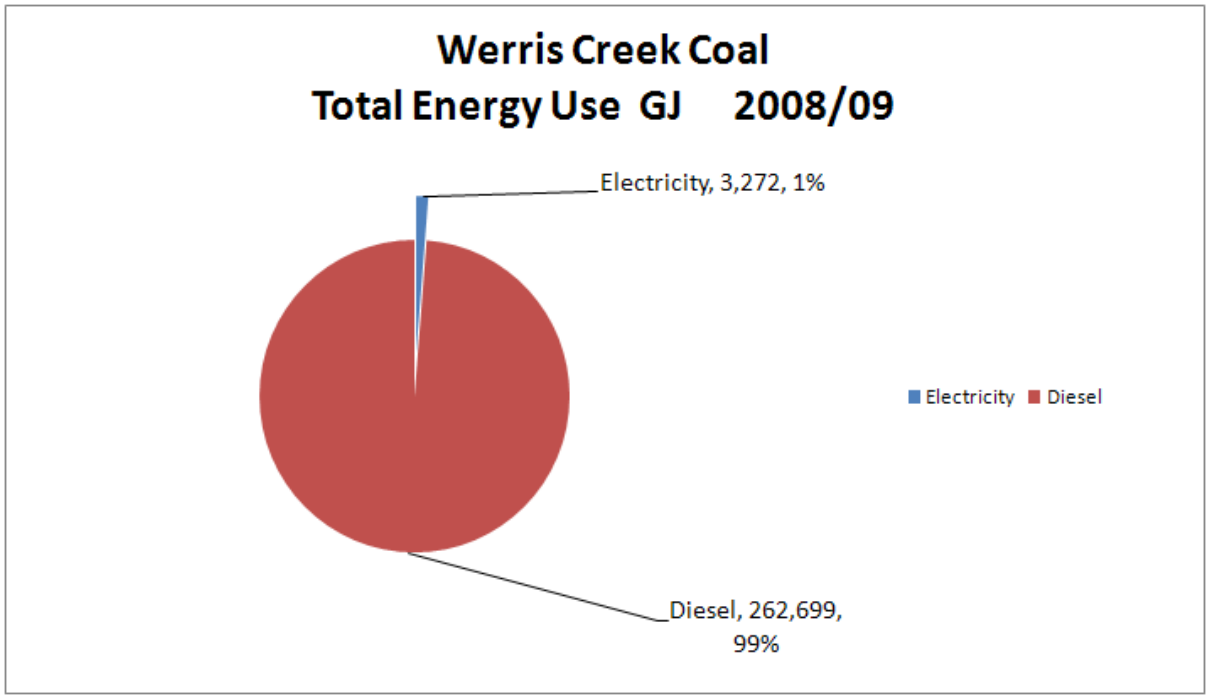

Figure 3 - Werris Creek Site Energy Balance 2008/09

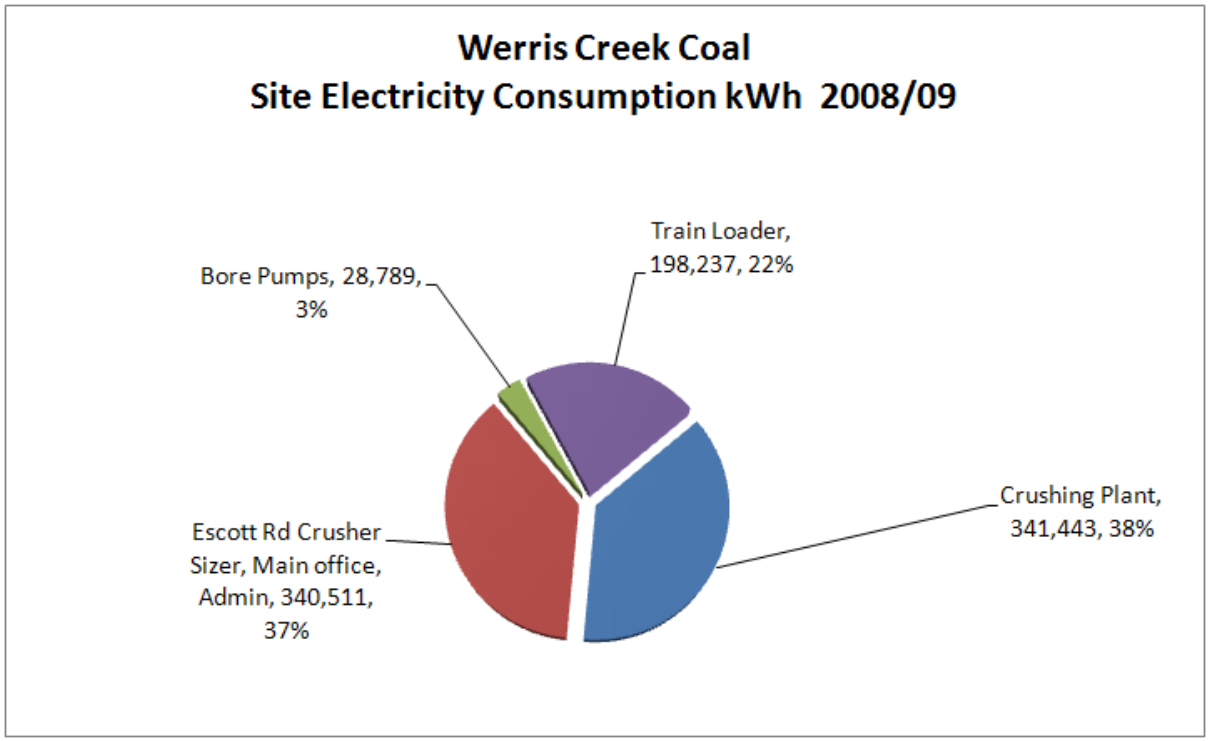

Figure 4 - Werris Creek Coal Site Electricity Balance 2008/09

8.7 Energy Efficiency Performance

A useful measure of the energy efficiency performance for Werris Creek Coal will be to monitor the key performance indicator of energy usage per tonne Run of Mine (ROM) coal produced and MJ per bank cubic metre total equivalent movement (BCM TEM).

The energy performances for the three years to 2008/2009 are shown in the tables below together with the predicted energy performance for the three following years. We will be aiming to operate at the lowest possible level commensurate with mine safety and good working practices.

The estimates of likely performance are shown in Tables 13 and 14 below:

Table 13 - Estimated Site Energy Performance (1)

TOTAL ENERGY	GJ Equivalent	Production tonnes ROM	MJ/tonne	GHG tonnes	GHG kg/tonne product	Energy Cost
2006/2007	268,329	1,326,270	202.3	21,541	16.2	$4,850,149
2007/2008	300,749	1,211,020	248.3	23,383	19.3	$8,097,278
2008/2009	265,972	1,082,835	245.6	20,623	19.0	$6,821,677
2009/2010	362,092	1,227,710	294.9	28,032	22.8	$ 7,239,639
2010/2011	442,400	1,500,000	294.5	34,249	22.8	$10,281,485
2011/2012	442,400	1,500,000	294.5	34,249	22.8	$12,044,310

Table 14 - Estimated Site Energy Performance (2)

TOTAL ENERGY	GJ Equivalent	Production tonnes BCM TEM	MJ/BCM TEM	GHG tonnes	GHG kg/BCM TEM	Energy Cost
2006/2007	268,329	7,437,220	36.1	21,541	2.9	$4,850,149
2007/2008	300,749	7,927,517	37.9	23,383	2.9	$8,097,278
2008/2009	265,972	7,368,789	36.1	20,623	2.8	$6,821,677
2009/2010	362,092	10,304,457	35.1	28,032	2.7	$ 7,239,639
2010/2011	442,400	12,571,429	35.1	34,249	2.7	$10,281,485
2011/2012	442,400	12,571,429	35.1	34,249	2.7	$12,044,310

Emissions factors for electricity and diesel have been taken from National Greenhouse Accounts (NGA) Factors of June 2009. Greenhouse gas emissions include Scopes 2 and 3 emissions factors for electricity and Scopes 1 and 3 for diesel. Fugitive emissions are not included in this analysis.
Additional figures showing the energy performance of the site are shown below:

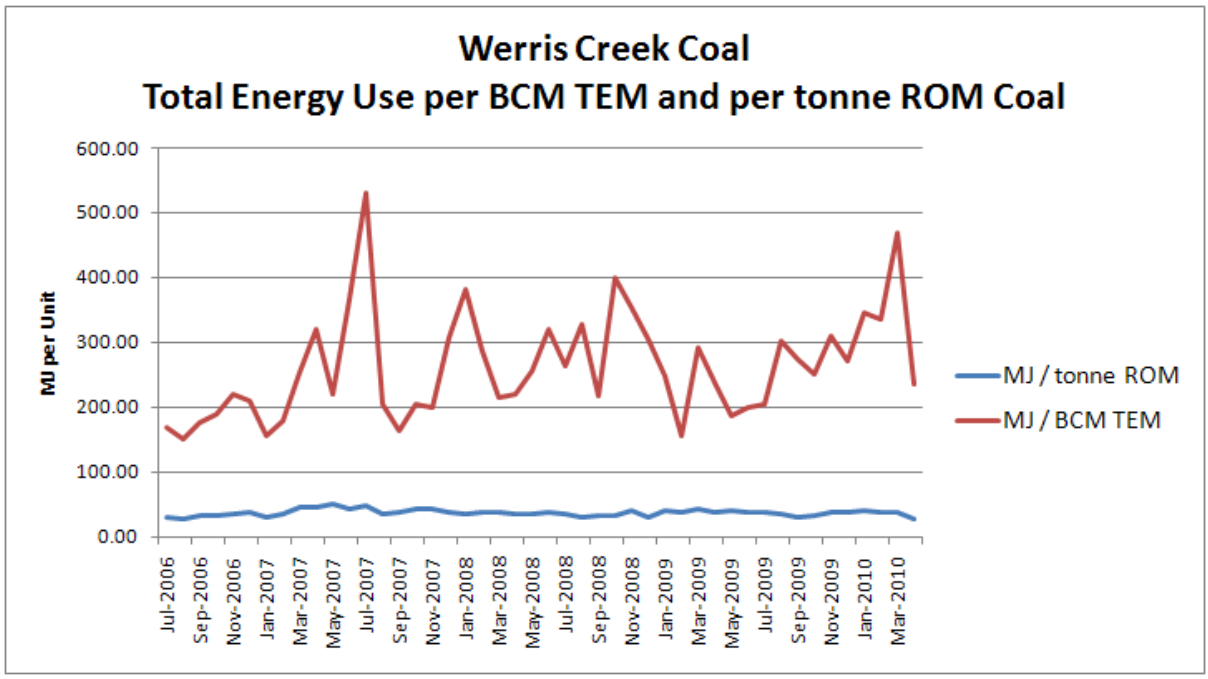

Figure 5 - Werris Creek Energy Use per BCM TEM and per tonne ROM

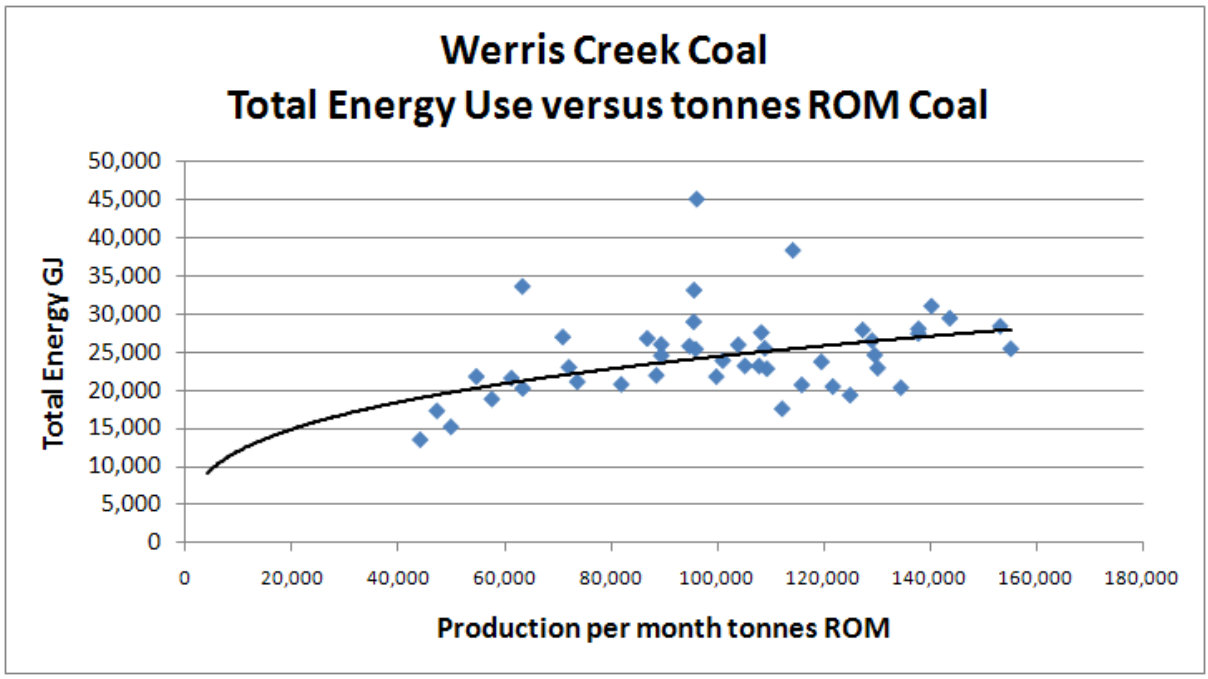

Figure 6 - Werris Creek Total Energy Use versus tonnes ROM Coal

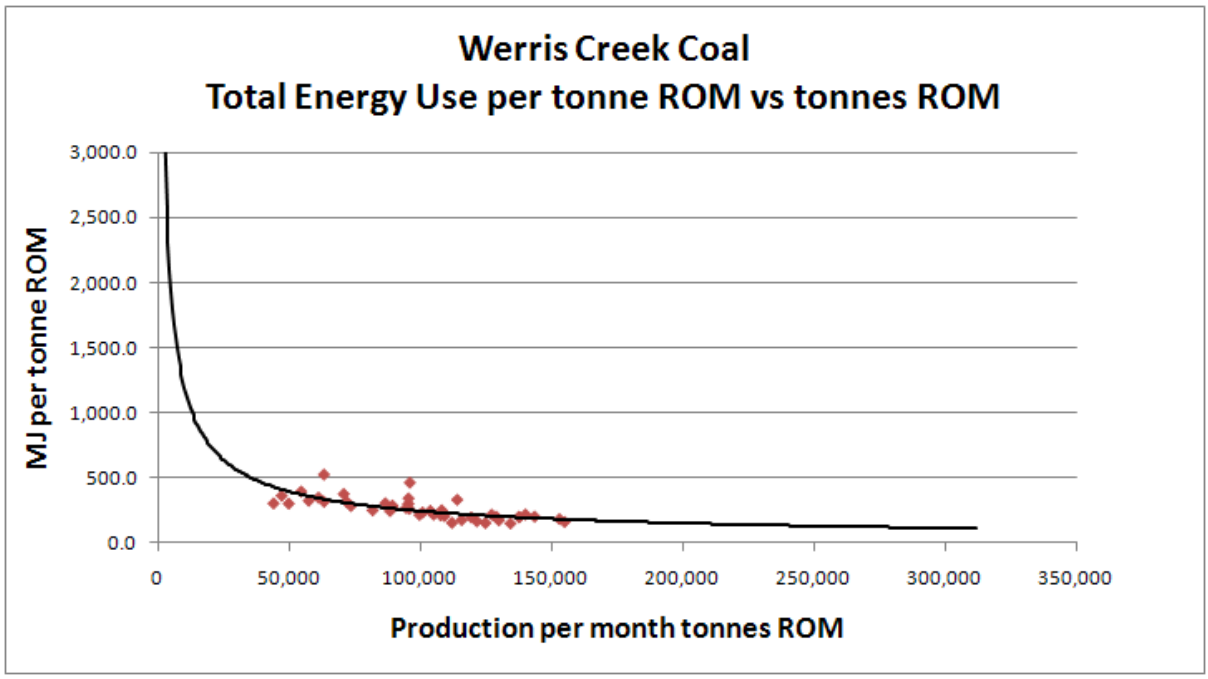

Figure 7 - Werris Creek Total Energy Use/tonne ROM versus tonnes ROM

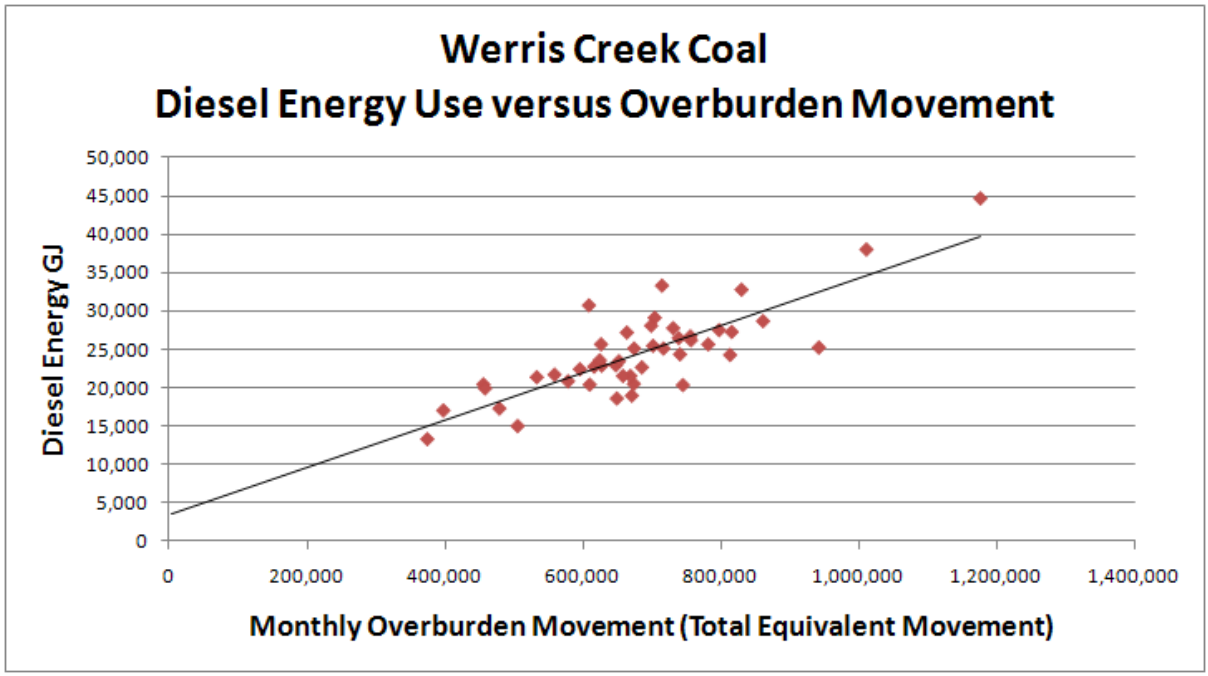

Figure 8 - Werris Creek Total Diesel Energy versus Overburden Movement

8.8 Energy Target

Any energy target is affected by production levels and fixed loads that are incurred whether or not there is any production. In addition, depending on which indicator is adopted, e.g., MJ/tonne ROM or MJ/tonne BCM TEM, the performance in affected significantly by the stripping ratio and the distance through which overburden is moved. At Werris Creek Coal other factors would remain reasonably constant. Thus in comparing the energy performance at Werris Creek with the two other similar open cut mines, Rocglen and Sunnyside, it is considered that the key consideration is the stripping ratios at each mine site.

The current average stripping ratio at Werris Creek is between 7 and 8 compared to stripping ratios of about 3.7 for Rocglen and about 5 for Sunnyside. The estimated energy performances at those sites are (Rocglen) 32.6 MJ/BCM TEM and 145 MJ/tonne ROM and (Sunnyside) 32.8 MJ/BCM TEM and 175 MJ/ tonne ROM.

The current energy performance at Werris Creek is 35.1 MJ/BCM TEM and 294 MJ/tonne ROM which is consistent with the stripping ratio. Our other information indicates that the better performing similar small open cut coal mines with lower stripping ratios (3.5 – 5) can achieve an energy performance of 130 MJ/tonne ROM and/or 26 MJ/BCM TEM. We are aware of some mines that have achieved a better performance than this level. Clearly the energy performance is dependent on site specific conditions and circumstances. However we will aim to achieve the best energy performance possible.

At this stage no specific target has been set.

Future reports on this ESAP will discuss what has been achieved in relation to estimated energy performance levels, any future identified projects and provide a detailed quantitative measure of energy performance at that time.

8.9 Identification of Potential Energy Savings Measures

Possible energy savings measures and control processes are detailed in Section 3.1 above.

The management actions listed in Table 8 have been included in the following table, which shows assessment of Energy Savings Potential.

The format used in this table is based on the template in the DEUS *Guidelines for Energy Savings Action Plans.*

Table 15 - Assessment of Potential Energy Savings Measures

No	Measure Description	Planned Responsibility	Estimated Cost to Implement	Energy Savings kWh or MJ	Total Cost Savings ($/year)	Internal Rate of Return	Time required to Implement	Planned Completion Date
Considered to be most likely Cost-Effective Opportunities								
1	Assign responsibilities for energy use reporting.	PM - EO	tba	tba	tba	tba	N/A	Complete
2	Generate monthly reports of site energy use.	PM - EO	tba	tba	tba	tba	Ongoing	Ongoing
3	Create energy target (when appropriate) and review during the annual ESAP update	PM	tba	tba	tba	tba	12 months	During annual ESAP review
4	Monitor and report on the Key Performance Indicator for energy use across the site.	EO	tba	tba	tba	tba	12 months	During annual ESAP review
5	Replace diesel powered drive pacs (power supply units for screening and conveyor – total of 90 HP) with electrically powered units (68kW motor loads)	CPM	tba	tba	tba	tba	12 months	2009 / 2010

PM – Project Manager CPM – Coal Processing Manager EO – Environmental Officer

9.0 Summary and Recommendations

The energy savings measures listed in this report provide an estimated “snapshot” of the activities currently being planned.

Werris Creek Coal views all cost reduction activities as a continuous process and intends to embed the practices in Werris Creek’s operating principles and procedures. New projects will be identified as technology changes and earlier opportunities revisited as cost/benefit ratios change.

Please contact site management if you have any questions or comments associated with this document.