WHITEHAVEN COAL

WHITEHAVEN COAL LIMITED

Rocglen Coal Mine Extension Project

Project Application under Part 3A of the EP&A Act 1979

Response to Submissions

June 2011

WHM01-008

GSS ENVIRONMENTAL

Environmental, Land and Project Management Consultants

Rocglen Coal Mine Extension Project

Project Approval 10_0015

Response to Submissions

Prepared on behalf of:

Whitehaven Coal Limited

By:-

GSS Environmental

Project Director: Andrew Hutton

Project Manager: Eryn Bath

Date: June 2011

Level 1, 241 Denison Street
BROADMEADOW NSW 2292

PO Box 907
HAMILTON NSW 2303

Phone: 02 4920 3000
Fax: 02 4961 3360
Web: www.gssenvironmental.com

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

1.0 INTRODUCTION

1.1 Background

The Environmental Assessment (EA) prepared to support an application by Whitehaven Coal Limited for a new Project Approval under Part 3A of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act) to expand operations at the company's Rocglen Coal Mine was finalised and lodged with the then NSW Department of Planning (now NSW Department of Planning and Infrastructure, DoPI) in early March 2011.

Following public exhibition and distribution of the EA to the relevant government agencies and stakeholders, a total of eight submissions were received by the DoPI in relation to the proposed Rocglen Extension Project. This document has been prepared in response to a request from the Director-General, in accordance with Section 75H(6) of the EP&A Act, to submit a response to the issues raised in the submissions.

The Part 3A transitional arrangements recently announced by the newly elected State Government do not appear to impact upon the Rocglen Extension Project with mining-related projects already in the Part 3A system to continue to be assessed and determined under Part 3A pending its legislative appeal. Rocglen Extension Project was declared a Major Project well before the 8 April 2011 deadline, and with only eight submissions and Council not opposing the Project it can continue to be determined by the DoPI (as opposed to the Planning Assessment Commission).

The Rocglen Coal Mine is located in the Gunnedah Basin of northern NSW, approximately 320 kilometres north-west of Newcastle. **Figure 1** positions the mine in its regional setting on Wean Road approximately 25 kilometres north of Gunnedah and 23 kilometres south-east of Boggabri.

Rocglen was originally approved by the Minister on the 15 April 2008 under Project Approval PA 06_0198. It was classified as a Major Project in accordance with the former *State Environmental Planning Policy (Major Projects) 2005* and, subsequently, was determined under Part 3A of the EP&A Act. The mining lease (ML 1620) was issued in June 2008 and coal production subsequently commenced in late 2008.

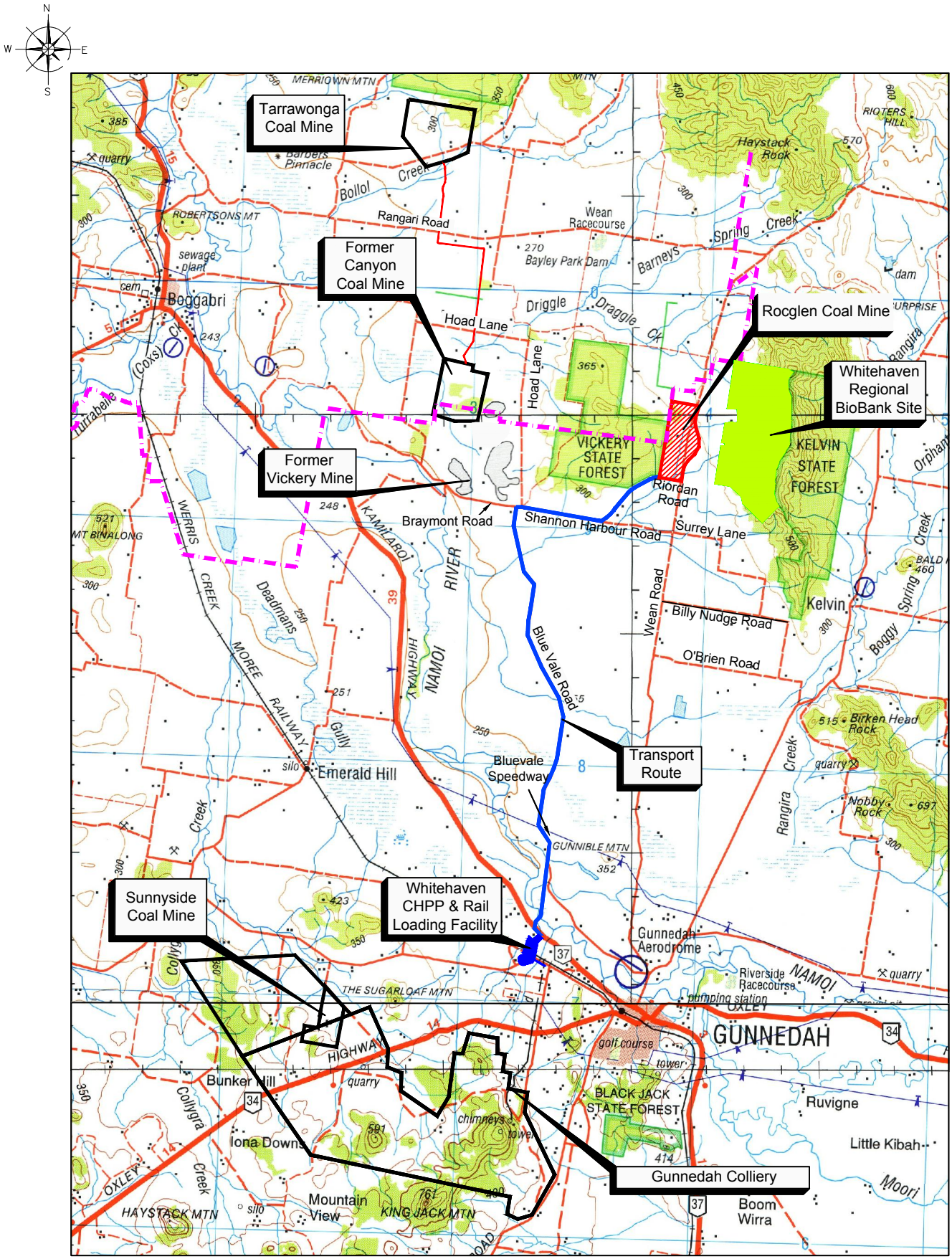
Following further drilling and definition of the local geological features, as well as additional reviews of the mine plan, Whitehaven now propose to expand operations at Rocglen in order to maximise resource recovery and allow for improved mine progression. The Rocglen Extension Project, if approved, would permit up to 5 million tonnes (Mt) of coal, not previously considered in the life of mine plan, to be extracted. This represents an increase in coal recovery from Rocglen by close to 30 percent.

The Project Site for the Rocglen Extension Project is defined on **Figure 2** and encompasses the areas within which mining and mining-related activities are currently approved under PA 06_0198 and those additional areas that are subject to the new Part 3A Project Application.

1.2 Rocglen Extension Project

1.2.1 Objectives

As part of the life of mine planning process at the Rocglen mine, further exploration drilling was undertaken at the site to better define the local geological features, as well as to provide additional data for inclusion in a review of the mine plan. This program identified additional economic coal reserves that could be accessed by an extension to the existing open cut. On this basis, Whitehaven proposes to expand operations at the Rocglen Coal Mine in order to maximise resource recovery and allow for improved mine progression.

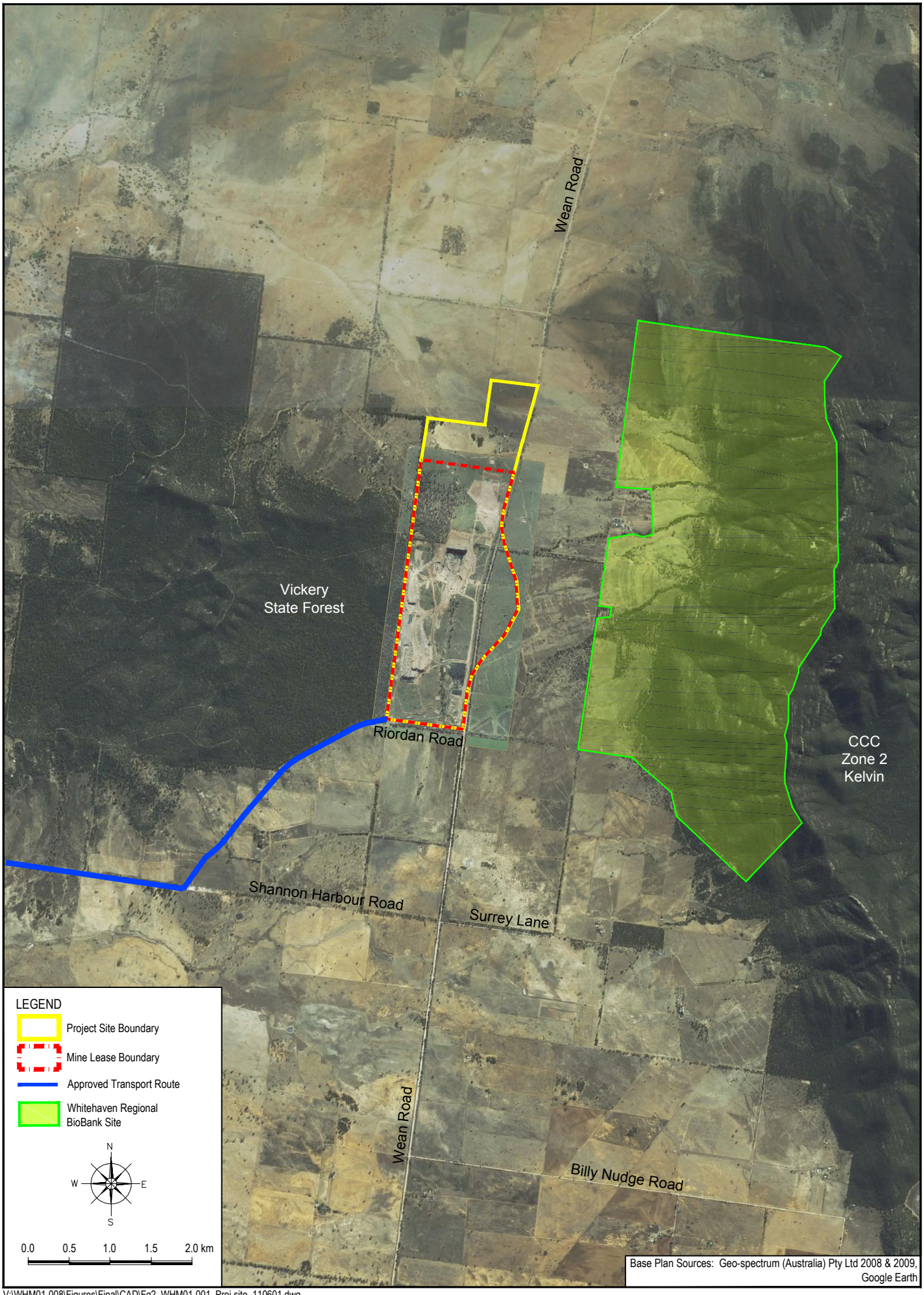


Base Plan Source: RWC 2007
- Manilla SH56-09 1:250 000

V:\WHM01-008\Figures\Final\CAD\Fg1_WHM01-008_Regional set_110601.dwg
To be printed A4

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Rocglen Coal Mine Extension Project
Regional Setting
FIGURE 1



V:\WHM01-008\Figures\Final\CAD\Fg2_WHM01-001_Proj site_110601.dwg
To be printed A4

GSS ENVIRONMENTAL
Environmental, Land and Project
Management Consultants

Rocglen Coal Mine Extension Project
Project Site
FIGURE 2

The objectives of the Rocglen Coal Mine Extension Project are to:

- Develop the on-going open cut operations with a focus on:
  - maximising resource recovery and maintaining continuity of coal production from the existing Rocglen Coal Mine beyond the currently projected life of mine;
  - maximising the use of existing infrastructure; and
  - securing on-going employment opportunities and socio-economic flow-on benefits;
- Provide additional out-of-pit emplacement area to accommodate overburden material from the existing operations and proposed pit expansion; and
- Continue to conduct mining at Rocglen in an environmentally responsible manner to ensure the potential for adverse impact is minimised.

1.2.2 Overview

Figure 3 illustrates the layout of the Rocglen Coal Mine as currently approved under PA 06_0198, and **Figure 4** illustrates the layout as proposed by the Rocglen Extension Project. While preliminary feasibility assessments for alternative development layout options (both within the Project Site and extending beyond the Project Site) were undertaken, the proposed configuration was selected as the optimal option in light of operational, environmental, economic and land ownership considerations.

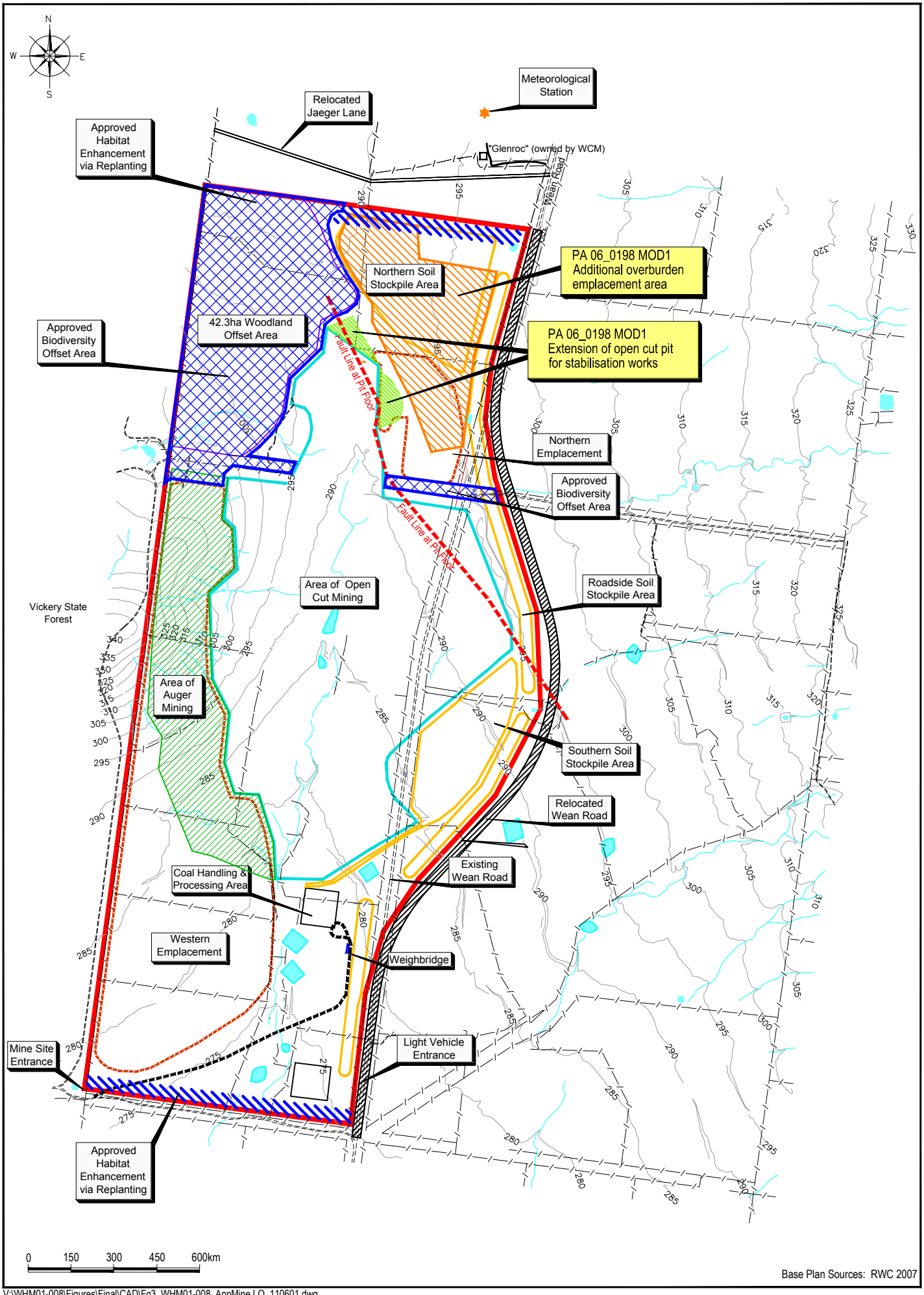
During the concept design and environmental assessments, specific refinements were made to the development configuration to minimise the potential for environmental and socio-economic impacts. In particular:

- Significant improvements have been made to the post-mining landform to ensure that a low maintenance, stable and safe landform is established that blends in with the surrounding topography and can support a mixture of rehabilitated bushland with areas of grazing consistent with the pre-mining conditions;
- Specific attention was given to the re-shaping and blending of emplacement areas with surrounding landforms, including the adjacent Vickery State Forest; and
- In response to submissions received following Adequacy Review of the draft EA, considerable effort has been afforded to minimising the size of the final void and improving the location and configuration of the final void (including appropriate battering of the low walls and highwall) within the constraints of mine planning and mine optimisation.

Table 1 summarises and compares the primary components of the existing Rocglen Coal Mine operation approved under PA 06_0198 (including PA 06_0198 MOD 1) and those of the proposed Rocglen Extension Project to be assessed and determined as a new Project Approval under Part 3A of the EP&A Act.

It is intended that the Rocglen Extension Project will be fully integrated with the remaining operational life of the current approved Rocglen mine, which will enable Whitehaven to operate under a single Project Approval over the life of the Project.

The Project does not involve any change to the coal production rate, methods of coal extraction, hours of operation, coal handling and processing techniques, site servicing, general waste management or employment approved under the current Project Approval 06_0198. The only change to the current mine fleet will be the addition of one 1250 excavator in the pit to enable cleaner and more efficient mining of coal (smaller machine).



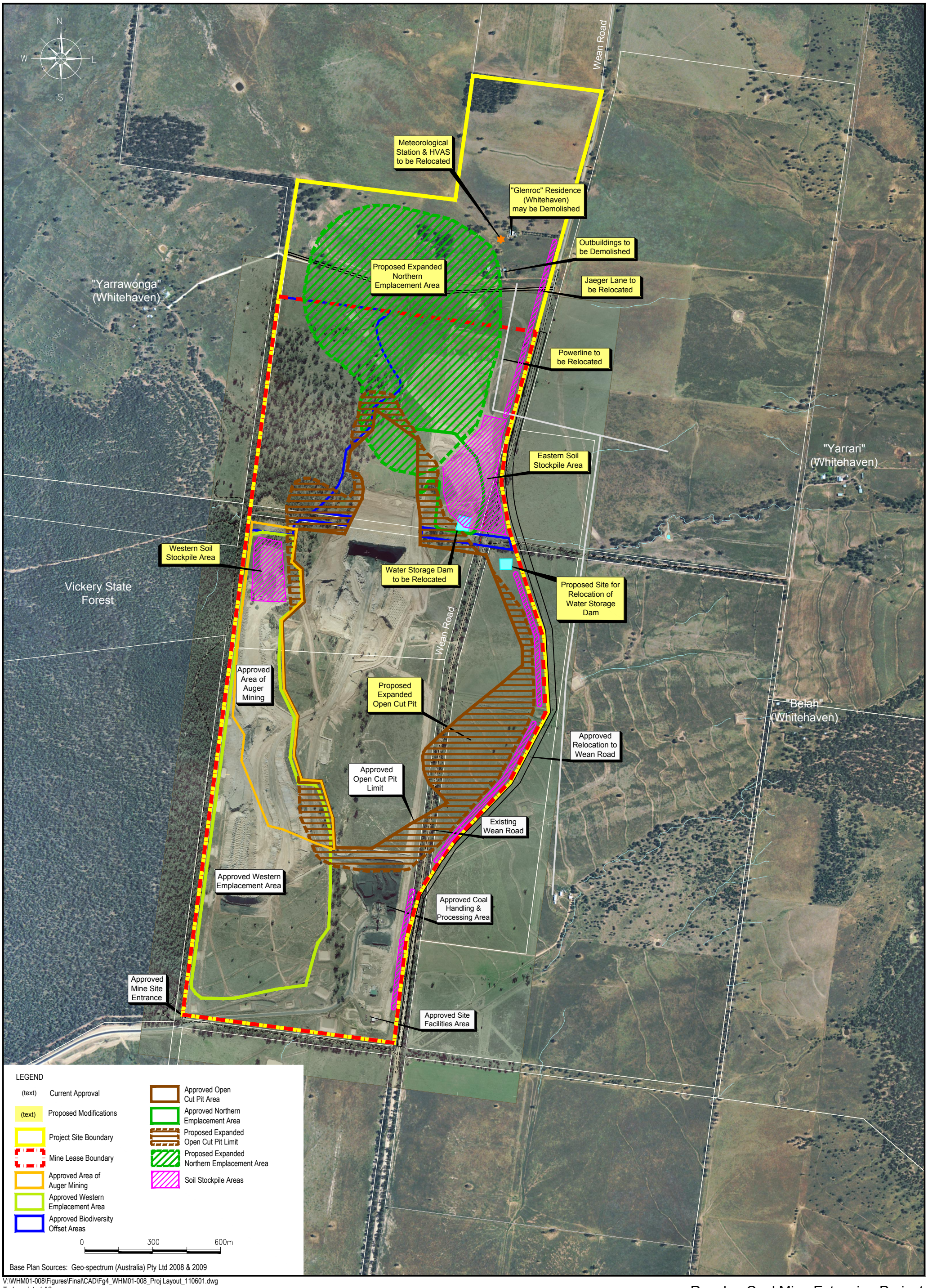
Base Plan Sources: RWC 2007

V:\WHM01-008\Figures\Final\CAD\Fg3_WHM01-008_AppMine LO_110601.dwg
To be printed A4

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Rocglen Coal Mine Extension Project
Approved Mine Layout (PA 06_0198)

FIGURE 3



V:\WHM01-008\Figures\Final\CAD\Fg4_WHM01-008_Proj Layout_110601.dwg
To be printed A3

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Rocglen Coal Mine Extension Project
Project Layout
FIGURE 4

Table 1– Major Components of the Approved Operation and Proposed Project

Aspect	Existing Approved Rocglen Coal Mine Operation	Proposed Rocglen Extension Project
Project Site Area	Approximately 366 hectares.	An additional 94 hectares of land, bringing the total area to approximately 460 hectares.
Production	Extraction and processing of up to 1.5 Mt of ROM coal per year.	No change.
Coal Seams	Upper Glenroc, Lower Glenroc and Belmont.	No change.
Mine Life	Between seven and ten years.	Up to an additional four years over the originally anticipated seven to ten years.
Vegetation Removal	Progressive campaign approach, with the extent of clearing undertaken in each campaign just sufficient for the subsequent year of mine development.	No change.
Soil Stripping and Stockpiling	Topsoil and subsoil stripping is undertaken separately to 15 cm and 35 cm, respectively, using open bowl scrapers and placed directly on mined, backfilled and reshaped areas awaiting rehabilitation or in designated stockpile areas adjacent to the areas of surface disturbance.	Methodology will generally remain the same with different varying depths of topsoil and subsoil suitable for stripping and different designated stockpile areas.
Overburden and Interburden Management	Overburden is blasted and loaded into trucks for transfer and placement in one of the two out-of-pit emplacement areas (Northern and Western Emplacement Areas) or in-pit within completed sections.	Methodology will remain the same with expansion of the Northern Emplacement Area's footprint and height to accommodate a maximum of 12 Mbcm (15 Mlcm) of material from current operations and proposed pit expansion.
Coal Extraction	Open cut mining methods (truck and excavator), with extraction of additional reserves uneconomical to extract by open cut methods using auger mining techniques.	No change.
Open Cut Area	Approximately 114 hectares, plus 2.05 hectares approved for emergency highwall stabilisation works (PA 06_0198 MOD 1).	Expansion of the open cut design limit by approximately 50 hectares to a total area of approximately 164 hectares.
Resource Recovery	Up to approximately 15 Mt of ROM coal.	Up to an additional 5 Mt of ROM coal.
Coal Processing	Transfer of mined coal by haul truck to a coal handling and processing area located immediately south of the limit of the open cut pit for crushing, screening and loading into trucks for transport off-site.	No change.
Coal Storage	Stockpiling of up to 150,000 tonnes of ROM coal on site.	No change.
Infrastructure	Site offices, workers amenities, workshop, fuel farm, coal crushing and handling plant, truck loading bin, weighbridge and surface water management system.	No additional building improvements. The surface water management system will be updated to effectively cater for the expanded operations.
Product Coal Transport	All crushed and screened coal is transported approximately 30 km to the Whitehaven CHPP, via an established coal haulage route, for selective washing, stockpiling and dispatch by rail and road.	No change.

Site Services	Systems in place for potable water, operational water, power, communications, fuel and explosives.	No change.
General Waste	Systems in place to manage general wastes, routine maintenance consumables, waste oils and grease, sewage and hydrocarbon-contaminated water.	No change.
Coal Rejects	A proportion of the coarse and fine coal rejects are approved to be returned from the Whitehaven CHPP to Rocglen for placement in the mined-out areas of the open cut.	No change.
Equipment	Various items of earthmoving and mining equipment throughout the life of the project.	The only change to the current fleet would be the addition of one 1250 excavator in the pit to enable cleaner and more efficient mining (smaller machine).
Hours of Operation	Mining operations are permitted to occur 24 hours a day, Monday to Saturday, with the exception of public holidays.	No change.
Employment	54 full-time jobs, with flow on employment for truck drivers (coal haulage contract) and additional indirect employment.	No change to employment levels, however employment positions would be maintained for the additional 4 years of project life.
Rehabilitation	While the major portion of rehabilitation activities would occur close to the cessation of mining, progressive rehabilitation will be undertaken through the life of the mine. Of the total anticipated disturbance area, approximately 84.4 hectares is to be restored as rehabilitated native vegetation (36 percent), with the remaining 152.6 hectares to be restored to rehabilitated agricultural land (64 percent).	Methodology will essentially remain the same, with the primary differences being the configuration of the final landform and final land use. Of the total anticipated disturbance area, it is proposed to restore approximately 206 hectares as rehabilitated bushland (58 percent), 147 hectares as rehabilitated pasture (41 percent), with the remaining 5 hectares comprising the retained highwall of the final void (1 percent).
Biodiversity Offsetting	A *Biodiversity Offset Strategy* resulting in the protection and rehabilitation of approximately 195.3 hectares, comprising the protection of 44.9 hectares of remnant woodland, enhancement planting and rehabilitation to 90.4 hectares and an additional 60 hectares within the Whitehaven Regional BioBank Site.	Revised *Biodiversity Offset Strategy* to compensate for the Project impacts and the impacts to the previously approved offset areas (i.e. cumulative impacts) on a 'like for like' basis with the equivalent of over 525 hectares of vegetation to be offset within the Whitehaven Regional BioBank Site. This will provide an offset to impact ratio of 4.75:1.
Road Relocations	The relocation of sections of Wean Road and Jaeger Lane.	Further relocation of the Jaeger Lane section only.
Environmental Management	A comprehensive set of environmental management plans and monitoring programs.	The current environmental management plans and monitoring programs will be reviewed and updated as required.

1.2.3 Environmental Assessment

The assessment of the Rocglen Extension Project in the EA was based on an integrated multi-disciplined approach and involved consultation with various government agencies, surrounding landholders and community groups. GSS Environmental (GSSE) prepared the EA on behalf of Whitehaven, with the following specialist reports prepared to assist in the assessment of the Project:

- Soil Survey and Land Resource Impact Assessment – GSSE (2010a);
- Preliminary Geotechnical Assessment – GE Holt and Associates (2011);
- Rehabilitation and Decommissioning Strategy – GSSE (2011);
- Flora and Fauna Impact Assessment – RPS (2010a);
- Biodiversity Offset Strategy – Eco Logical Australia (2010);
- Surface Water Assessment – GSSE (2010c);
- Cultural Heritage Survey and Assessment – RPS (2010b);
- Air Quality Impact Assessment – PAE Holmes (2011);
- Noise and Vibration Impact Assessment – Spectrum Acoustics (2010); and
- Hydrogeological Assessment – Douglas Partners (2010).

The potential environmental impacts of the Project have been kept to a minimum through:

- Undertaking preliminary feasibility assessments for several alternative development layout options (both within the Project Site and extending beyond the Project Site) and subsequently selecting a configuration considered optimal in light of operational, environmental, economic and land ownership considerations;
- Obtaining a detailed understanding of the issues and potential impacts via consultation and assessment to a level of detail commensurate with the scale of the Project, industry standards and the legislative framework under which the Project is permitted;
- The existing proactive strategies employed at Rocglen to avoid, minimise, mitigate, offset or manage potential impacts;
- A commitment to undertake site rehabilitation on a progressive basis;
- The development of appropriate and long-term beneficial post-mining landforms and land uses;
- A commitment to review and update the suite of environmental management plans and monitoring programs already implemented at Rocglen; and
- A comprehensive Statement of Commitments.

2.0 SUBMISSIONS

2.1 Overview

Following public exhibition and distribution of the EA to the relevant government agencies and stakeholders, a total of eight submissions were received by the NSW Department of Planning and Infrastructure (DoPI) in relation to the proposed Rocglen Extension Project. These submissions were received from:

- Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC);
- NSW Office of Environment and Heritage (OEH);
- NSW Office of Water (NOW);
- Minerals Resources Division of the NSW Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS Minerals Resources);
- NSW Heritage Branch;
- NSW Roads and Traffic Authority (RTA);
- Namoi Catchment Management Authority (Namoi CMA); and
- Mining and Energy Division of the Construction Forestry Mining and Energy Union (CFMEU).

Each of these submissions is addressed individually in the below sub-sections. The subject of the issues raised by each of the agencies and stakeholders, along with any general comments, is identified in ***bold italic text***, followed by the response in normal text.

Submissions received from the DTIRIS Minerals Resources and CFMEU confirmed that they did not have any objection to the proposal and did not raise any issues requiring response. There was no submission received from Gunnedah Council, nor from any residents or community groups.

2.2 Commonwealth Department of Sustainability, Environment, Water, Population and Communities

Eco Logical Australia (ELA), who prepared the *Biodiversity Offset Strategy* (2010) for the Rocglen Extension Project, was engaged to assist in responding to the issues raised by the SEWPaC. A copy of ELA's written response is contained within **Appendix A** and summarised below.

2.2.1 General

Please provide a map showing the EPBC listed ecological communities and suitable habitat for EPBC listed species within the project area.

Figure 1 in ELA's response (see **Appendix A**) comprises a plan from the *Biodiversity Offset* Strategy (ELA 2010) showing the vegetation types within the Project Site and clearly labelling the EPBC Act listed communities, the area of these communities (hectares) and location of impacts. The *Biodiversity Offset Strategy* (ELA 2010) advises that all of the remnant woodland vegetation (not derived grasslands) to be impacted (as shown on Figure 1 in **Appendix A**) is potential foraging habitat for the EPBC Act listed Swift Parrot and Regent Honeyeater, totalling approximately 46.9 hectares (the 47.04 hectares reported in the *Biodiversity Offset Strategy* has been updated to remove the 0.14 hectares of Brigalow which is not foraging habitat).

2.2.2 Offsets

For clarification, please include a summary table of the hectare quantities, location and condition of the proposed offsets for EPBC-listed communities and species habitat. Please include further details of the extent of rehabilitation/restoration proposed for the White Box - Yellow Box - Blakeley's Red Gum and Derived Native Grassland Ecological Community as part of the offset strategy.

The quantum (area) of offset required for the Rocglen Extension Project has been calculated using the NSW BioBanking Assessment Methodology. This methodology calculates the number of "credits" required at the impact site based on the area and condition of each vegetation type impacted and the number of credits generated at a BioBank Site based on the improvement in biodiversity values via conservation management. The results are expressed as a number of credits. For the purpose of EPBC Act considerations, the number of credits can be converted to area (hectare) equivalents based on the number of credits required/generated per hectare.

Table 2 provides a summary of the hectare quantities and condition of proposed offsets for EPBC Act listed communities.

Table 2 – Proposed Offsets - EPBC Act Listed Ecological Communities

EPBC Act Listed Ecological Community	Condition	Project Impacts (ha)	Credits Required	Credits to be Retired	Credits Generated per Hectare	Area of Offset (ha)	Offset to Impact Ratio
Brigalow[1]	Woodland	0.14	6	6	9.70	0.62	4.42
White-Box, Yellow Box, Blakely's Red Gum grassy woodland and DNG grassy woodland	Woodland	5.9	369	331	9.70	34.12	5.78
White-Box, Yellow Box, Blakely's Red Gum grassy woodland and DNG grassy woodland	DNG	10.9	407	1,065	9.00	118.33	10.86
Total Offset Proposed		**16.94**	**782**	**1,402**		**153.08**	**9.04**

1 - Brigalow to be offset with White Box woodland

As evident:

- The 0.14 hectares of Brigalow, which was not determined a controlled action by the SEWPaC, will be offset with 0.62 hectares of White-Box, Yellow Box, Blakely's Red Gum grassy woodland. This provides an offset to impact ratio of 4.42 to 1;
- The 5.9 hectares of White-Box, Yellow-Box, Blakely's Red Gum grassy woodland remnants in six small patches along the margins of Wean Road will be offset by 34.12 hectares of White-Box, Yellow-Box, Blakely's Red Gum grassy woodland. This provides an offset to impact ratio of 5.78 to 1; and
- The 10.9 hectares of White-Box, Yellow-Box, Blakely's Red Gum derived native grassland in a paddock cultivated and grazed for many decades yet still retains a predominantly native understory (53 percent ground cover) and there are 12 or more native understory species other than grasses thus meeting the EPBC Act listed ecological community (it is noted that exotic pasture grasses consisted 47% of the ground cover) will be offset by 118.33 hectares of White-Box, Yellow-Box, Blakely's Red Gum derived native grassland. This provides an offset to impact ratio of 10.86 to 1.

Table 3 provides a summary of the impacts to potential foraging habitat for the Swift Parrot and Regent Honeyeater (46.9 hectares) and the area of suitable woodland foraging habitat to be set aside as offset (231.42 hectares), providing an offset to impact ratio of 4.93 to 1. When combined with the area of derived native grassland that will be restored to woodland (118.33 hectares), this increases the future potential foraging habitat for these species, permanently protected and managed, to 349.75 hectares, which is an offset to impact ratio of 7.46 to 1.

Table 3 – Proposed Offsets - EPBC Act Listed Species Habitat

Swift Parrot and Regent Honeyeater Potential Foraging Habitat	Condition	Project Impacts (ha)	Credits to be Retired	Credits Generated per Hectare	Area of Offset (ha)	Offset to Impact Ratio
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone	Woodland	27.9				
Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)	Woodland	3.4				
White-Box, Yellow Box, Blakely's Red Gum grassy woodland and DNG woodland	Woodland	5.9	331	9.70	34.12	
White Box - White Cypress Pine Shrubby open forest of the Nandewar and Brigalow Belt South bioregions	Woodland		1,073	7.50	143.07	
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	Woodland	9.7	564	10.40	54.23	
Total		**46.9**	**1,968**		**231.42**	**4.93**
Future Potential Foraging Habitat (canopy regeneration)						
White-Box, Yellow Box, Blakely's Red Gum grassy woodland and DNG grassy woodland	DNG to be restored		1,065	9.00	118.33	2.52
				Total Future Potential Habitat	**349.75**	**7.46**

The proposed offset site is within the Whitehaven Regional BioBank Site, which is 100 percent owned by Whitehaven. **Figures 1** and **2** of this response show the regional location and expanse of the BioBank Site, including proximity to Rocglen and the adjoining Community Conservation Area (CCA) Zone 2 Kelvin. This area was formally known as the Kelvin State Forest, however is now reserved under the NSW *National Parks and Wildlife Act 1974* (NPW Act) as Aboriginal area.

Figure 4 of ELA's response in **Appendix A** shows the location of the EPBC Act listed ecological communities within the Regional BioBank Site to be used as offsets for the Rocglen Extension Project.

The Regional BioBank Site will be protected on title by a BioBanking Agreement entered into with the NSW Minister for the Environment under the *NSW Threatened Species Conservation Act 1995* (TSC Act) and will be managed in perpetuity in accordance with a BioBanking Management Plan approved by the Minister with management funds (calculated for in-perpetuity management) held in Trust (see Section 5 of the *Biodiversity Offset Strategy*, ELA 2010).

The BioBanking Management Plan provides for the management of access, weeds and feral animals across the entire BioBank Site, the enhancement of woodland areas and restoration of derived grassland areas by permanent exclusion of grazing, and targeted planting of tree, mid storey and ground cover species.

Agreement has been reached with the NSW National Parks and Wildlife Service (now part of the OEH) to transfer the land at the end of year 10 for dedication as an addition to the adjoining CCA Zone 2 Kelvin. A BioBanking Agreement is the highest level of protection that a conservation area can receive other than dedication under the NPW Act. Only the NSW Minister for the Environment can approve any detrimental activities within a BioBank Site and these must be offset.

The proposed offset package for the Rocglen Extension Project is consistent with the draft Commonwealth offset principles. In summary:

- The offset package is a direct package (Principle 4) that is targeted to the EPBC Act matters that are being impacted and determined to be a controlled action (Principle 1), are on a like for like basis (Principle 5):
  - 1,402 White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grassland biodiversity credits are being retired to offset impacts to 5.9 hectares of intact White Box woodland along Wean Road and Jaeger Lane and 10.9 hectares of derived native grassland within the mine site boundary. Of these, 337 credits (equivalent to 34.74 hectares) are woodland credits and 1,065 credits (equivalent to 118.33 hectares) are derived grassland credits. This will provide offset to impact ratios of 5.78 to 1 and 10.86 to 1, respectively; and
  - 231.42 hectares of suitable foraging habitat for the Regent Honeyeater and Swift Parrot will also be protected to replace the loss of 46.9 hectares of suitable foraging habitat (intact woodland remnants) as a result of the mine extension, which will provide an offset to impact ratio of 4.93 to 1. When combined with the 118.33 hectares of derived grassland to be restored to woodland, this totals 349.75 hectares of potential future foraging habitat and an offset to impact ratio of 7.46 to 1
- The Whitehaven Regional Biobank Site will have the highest level of conservation status outside of National Parks via a registered BioBanking Agreement on title (Principles 3 and 7);
- The Whitehaven Regional Biobank Site is to be actively managed via a BioBanking Management Plan with in-perpetuity management costs held in Trust (Principles 3 and 7);
- The offset area is less than 1 kilometre to the east of the Project Site and is therefore in the same general area as the development activity (Principle 6);

- The offset is enforceable and will be monitored and audited in accordance with the BioBank Agreement (Principle 8); and
- The Whitehaven Regional Biobank Site enhances and provides strategic conservation outcomes to the west of the CCA Zone 2 Kelvin Aboriginal Area and provides protection to vegetation types not well represented in the existing reserve system (White Box Grassy Woodland). The Whitehaven Regional BioBank Site also enhances north-south connectivity on a regional scale and will eventually form part of an east-west link with Vickery State Forest once the Rocglen Coal Mine is rehabilitated (Principle 2).

To assist in the assessing the degree of risk of future disturbance to the proposed offsets, please provide details of all identified coal resources (including current or likely exploration or mining applications or leases) in the vicinity of the proposed offset sites.

Whitehaven does not know to any certainty the location and details of all economic coal resources within the area, and can certainly not predict likely exploration or mining applications/leases within the area.

We anticipate that the SEWPaC is trying to ascertain the potential for the proposed offset site to be impacted upon by future mining activities. Given that the *Biodiversity Offset Strategy* (ELA 2010) for the Rocglen Extension Project (including replacement of original offset areas) is to retire the full 4,859 credit requirement from the Whitehaven Regional BioBank Site, there will be no opportunity for the offset site to be diminished or impacted upon.

As outlined above, the Whitehaven Regional Biobank Site will provide for the long-term conservation of approximately 1,500 hectares of Whitehaven-owned land approximately 900 metres to the east of the Project Site. The BioBank Site will be protected on title by a BioBanking Agreement entered into with the NSW Minister for the Environment under the TSC Act and will be managed in perpetuity in accordance with a BioBanking Management Plan approved by the Minister with management funds (calculated for in-perpetuity management) held in Trust (see Section 5 of the *Biodiversity Offset Strategy*, ELA 2010).

Agreement has been reached with the NSW National Parks and Wildlife Service (now part of the OEH) to transfer the land at the end of year 10 for dedication as an addition to the adjoining CCA Zone 2 Kelvin. A BioBanking Agreement is the highest level of protection that a conservation area can receive other than dedication under the NPW Act. Only the NSW Minister for the Environment can approve any detrimental activities within a BioBank Site and these must be offset.

On this basis, it is obvious that Whitehaven is committed to the long-term conservation of the offset site and, again, there is no opportunity for the offset site to be diminished or impacted upon.

Please clarify whether, in considering the significance of Project impacts on habitat for EPBC species and ecological communities, consideration has been given to similar habitat impacts resulting from other planned or potential mining developments in the region, where this information is publicly available (including, but not necessarily limited to, proposed open cut coal mines in the Boggabri and Narrabri regions). If not, please include details of how any relevant recent or predicted habitat clearance resulting from these developments may alter the importance of habitat on the project site, in the regional context.

At this point in time, Whitehaven does not have detailed or firm assessment information relative to any potential future mining developments or expansions of the company's existing operations within the region. Whitehaven is working towards an extension of it's existing Tarrawonga operation and has concept plans for a re-opening of the former Vickery Coal Mine west of the Rocglen site. However at the time of preparing the EA for the Rocglen Extension Project there was no detailed information available on these projects in terms of vegetation type and/or condition that may be impacted by these potential projects.

Similarly, Whitehaven is not privy to the planned or potential mining developments of other companies within the region other than the information in the public domain which is limited to the details released by relevant companies, and can certainly not predict likely exploration or mining applications/leases within the area. On this basis, Whitehaven has assessed the impacts on habitat for EPBC Act listed species and ecological communities on the basis of the available information at the time, and on the basis of the known impacts from the Rocglen proposal.

Standard practice in environmental impact assessment when considering cumulative impacts is to include only the known impacts (i.e. existing operations and those projects approved but not yet commenced). If we were to consider planned or potential projects, even those where Director-General's Requirements (DGRs) have been issued or the environmental studies are in progress, this is making the assumption that these projects will be approved, which may not be the case.

We believe that the EA prepared for the Rocglen Extension Project, including the *Biodiversity Offset Strategy*, adequately and appropriately considered the relevant cumulative impacts of the proposed expansion with the current Rocglen operation and any other known projects within the vicinity. Based on the following points, we believe that the Rocglen Extension Project poses minimal risk for significant cumulative impacts over and above those originally approved under PA 06_0198:

- The nearest operational mine is approximately 15 kilometres from the Project Site and we are unaware of any additional projects that have been approved within this distance of the site; and
- The configuration of the Rocglen Extension Project has been refined to maximise the use of existing infrastructure and minimise expansion of the original Project Site.

2.3 NSW Office of Environment and Heritage

2.3.1 Surface Water Impact Assessment

The EA states that the Surface Water Management Plan (SWMP) will be developed in accordance with the Blue Book (Volume 1 and Volume 2E). Whilst this is suitable for dirty water management structures, a different design criteria applies to contaminated water management structures.

Recommendation:

The SWMP must provide for all contaminated water structures which have the potential to contaminate groundwater to be constructed:

- ***To achieve permeability of $1x10^{-9}$ m/sec; and***
- ***Have the capacity to contain a storm event with a frequency of a 1 in 100 year, 72 hour duration event (calculated using the Australian Standard – Australian Rainfall and Runoff Criteria).***

The mine site water management system essentially comprises a clean water management system, dirty water management system and a mine water management system, which are all aimed at preventing the contamination of local water resources. When the NSW Office of Environment and Heritage (OEH) discusses contaminated water management structures, we assume this comprises those structures used to manage mine water, which is water generated in the open cut pit primarily as a result of rainfall/runoff and some groundwater seepage, as well as any structures that manage flows from the ROM coal pad area and possibly the workshop/facilities area.

Mine water will continue to be directed to and contained within the open cut via in-pit sumps until it is necessary to pump the water to the on-site Mine Water Dam constructed as a 'turkeys nest' at the nominated permeability to receive mine water only (i.e. no catchment). Water collected in the open cut pit and/or dirty water dams will be used, as much as possible, for dust suppression purposes. This is the preferential use of water on-site to minimise the chance of pollution to downstream waterways. No changes are proposed to the existing water management system in and around the workshop and ROM facilities area. Bunded areas around the workshop drain to the oil water separator to contain any fuel/oil spills within the workshop, whilst drainage from the ROM is directed via a series of surface water storages.

Whitehaven is committed to ensuring that local water resources are not adversely impacted as a result of on-site water management practices.

2.3.2 Biodiversity Impact Assessment - Assessment of Impacts

Conclusions regarding the likely impacts of the proposal on threatened species have been partially based on the extent of habitat available within the Vickery State Forest. However based on information presented at the recent mining offsets meeting with DoP (23 March 2011) we now understand that the proponent has an interest in extending their mining operations into the Vickery State Forest. This factor is not acknowledged within the EA.

Recommendation:

That DoP take this into consideration in their assessment of the EA.

At this point in time, Whitehaven does not have a specific mine plan relative to the potential Vickery project. Whilst conceptually it is intended to re-open the former Vickery area to mining, there are no current plans for this operation to extend into the Vickery State Forest. On this basis, Whitehaven has assessed the impacts of the proposed Rocglen Extension Project on the basis of the available information at the time, and on the basis of the known impacts from the Rocglen proposal.

As outlined above, standard practice in environmental impact assessment when considering cumulative impacts is to include only the known impacts (i.e. existing operations and those projects approved but not yet commenced). If we were to consider planned or potential projects, even those where Director-General's Requirements (DGRs) have been issued or the environmental studies are in progress, this is making the assumption that these projects will be approved, which may not be the case.

We believe that the EA prepared for the Rocglen Extension Project, including the Biodiversity Offset Strategy, adequately and appropriately considered the relevant cumulative impacts of the proposed expansion with the current Rocglen operation and any other known projects within the vicinity. The configuration of the Rocglen Extension Project has been refined to maximise the use of existing infrastructure and minimise expansion of the original Project Site, which is particularly important in relation to potential ecological and biodiversity impacts.

2.3.3 Biodiversity Impact Assessment - Avoidance

Priority should also be placed on avoidance of impacts in the first instance. The Office previously recommended that the proponent:

- ***Re-assess the potential for infrastructure and operational activities to be located such that a greater area of existing native vegetation is avoided; and***
- ***Commit to upfront avoidance of defined areas of remnant vegetation on the site.***

…..it remains important for the proponent to commit upfront to avoiding impacts on native vegetation resulting from the current proposed development as far as possible.

Recommendation:

That the proponent be required to:

- ***Clearly identify (on a single map) and justify all areas within which the site associated infrastructure and operational activities are to be located, considering all options for minimising the affected area; and***
- ***Clearly identify the remaining area of native vegetation on the site and commit to exclusion of this remnant from the impact of the current project proposal.***

Figure 3 illustrates the layout of the Rocglen Coal Mine as currently approved under PA 06_0198, and **Figure 4** illustrates the layout as proposed by the Rocglen Extension Project. While preliminary feasibility assessments for alternative development layout options (both within the Project Site and extending beyond the Project Site) were undertaken, the proposed configuration was selected as the optimal option in light of operational, environmental, economic and land ownership considerations. Furthermore, during the concept design and environmental assessments, specific refinements were made to the development configuration to minimise the potential for environmental and socio-economic impacts.

Figure 4, which has been sourced directly from the EA, clearly identifies (on a single map) all areas within which the site associated infrastructure and operation activities are - (a) currently located under the provisions of PA 06_0198; and (b) proposed to be extended under the provisions of the Rocglen Extension Project. While efforts have been made to avoid potential impacts, primarily though refining the location and configuration of the expanded Northern Emplacement Area and limiting the extension of the mining operation outside of the approved Project Site, the options for further refinement are restricted due to the fact that the Rocglen mine is approved, established and operational. This includes primary infrastructure, including the open cut pit, overburden areas, water management system, coal handling and processing area and site facilities area. Whitehaven have configured the Rocglen Extension Project as best it can within the constraints of mine planning, mine optimisation and land ownership, and maximising the use of existing approved infrastructure.

We do not believe it is necessary to formally commit to the exclusion of remaining areas of native vegetation within the Project Site given the constrained nature of the site and operation, the efforts that have been made to maximise the use of existing approved infrastructure and minimise the expansion of operations outside of the Project Site and upon undisturbed lands, and the fact that the *Biodiversity Offset Strategy* (ELA 2010) has been prepared to account for all remaining vegetation within the site (with the exception of approximately 30 hectares in the north-eastern corner encompassing a small area of Poplar Box Grassy Woodland, which will be retained). As outlined in the EA, this approach has been adopted, regardless of whether the clearing/disturbance occurs, in order to provide some flexibility, if required, to site project-related infrastructure and undertake site management in peripheral areas (for example, vehicle access and manoeuvring, surface water management and stockpiles). This approach will also provide flexibility if future geological exploration and economic modelling determine recoverable coal reserves within these peripheral areas, which, if approval was granted for extraction, would enable Whitehaven to further maximise coal recovery using existing infrastructure at an approved operation.

2.3.4 Biodiversity Impact Assessment – Offset Proposal

The approach taken in calculating the offset required is generally satisfactory, however the proposal has not provided a 'maintain or improve' outcome, nor fully justified the ability of the proposed offset to met the 'like for like or better' principle.

Recommendation:

That DoP:

- ***Require the proponent to remove claims of meeting the 'improve of maintain' standard from the EA.***
- ***Request the proponent to provide adequate information to justify their proposed 'matching' of vegetation types.***
- ***Encourage the proponent to improve the ability of the offset to meet the 'like for like or better' principle as far as possible.***

Eco Logical Australia (ELA), who prepared the *Biodiversity Offset Strategy* (2010) for the Rocglen Extension Project, was engaged to assist in responding to this issue. A copy of ELA's written response is contained within **Appendix A** and summarised below.

Clarification Regarding 60 Hectares of Original Offset

The proposed *Biodiversity Offset Strategy* (ELA 2010) for the Rocglen Extension Project, which comprises the retirement of 4,859 biodiversity credits from the Whitehaven Regional BioBank Site, is in addition to the original project approval condition to set aside 60 hectares in the Regional BioBank Site. The location and vegetation types of this 60 hectares has previously been agreed to with the then DECCW and is equivalent to 589 credits (271 White Box - White Cypress Pine shrubby open forest and 318 White Cypress Pine - Narrow-leaved Ironbark open forest credits respectively).

Proposal Has Not Provided a "Maintain or Improve" Outcome

Following discussions between ELA and OEH on the 25 May 2011, it was agreed that the proposed *Biodiversity Offset Strategy* does not meet an improve or maintain outcome as defined by the OEH due to the matching of some vegetation types. However, the OEH indicated that the proposed strategy was consistent with previous discussions and agreements (i.e. use of the Regional BioBank Site), provided for in-perpetuity protection and funded management of a single consolidated offset area and contributed to regional conservation priorities by securing a significant area of land adjacent to an existing NPW Act reserve that enhances a north-south link to the Mount Kaputar range.

On this basis, the proposed *Biodiversity Offset Strategy* (ELA 210) is consistent with the NSW Offset principles, particularly Principles 6 and 10. Key components of the offset package include:

- The vegetation at the Whitehaven Regional Biobank Site is generally of equal or greater conservation status to the Project Site other than the partial use of Semi-evergreen vine thicket to partially offset impacts to Piliga Box and Poplar box; and White-Box Cypress Pine shrubby open forest to offset remaining impacts to Piliga Box (Principle 10 Offsets must be targeted on a like for like or better conservation outcome).
- The proposed offset area (approximately 525 hectares based on an average of 9.25 credits generated per hectare in the BioBank site) is 4.75 times the size of the cumulative area to be impacted (110.44 hectares) at the Project Site (mine extension impacts of 95.44 hectares and replacement offset for impacts to 47.9 hectares of the 111.3 hectares of the original offsets provided for the original mine approval, the equivalent of 15 hectares of impact) (Principle 6 Offsets should aim to result in a net improvement in biodiversity over time and Principle 9 Offsets must be quantifiable). These quantums have been calculated using a biometric tool that considers the structure, function and compositional elements of biodiversity (Principle 5).
- The Whitehaven Regional BioBank Site will have the highest level of conservation status outside of National Parks via a registered BioBanking Agreement on title (Principle 7 Offsets must be enduring).
- The Whitehaven Regional BioBank Site is to be actively managed via a BioBanking Management Plan with in-perpetuity management costs held in Trust (Principle 7 Offsets must be enduring).
- The Whitehaven Regional BioBank Site enhances and provides strategic conservation outcomes to the west of the CCA Zone 2 Kelvin Aboriginal Area and provides protection to vegetation types not well represented in the existing reserve system (White Box Grassy Woodland). The Whitehaven Regional BioBank Site also enhances north-south connectivity on a regional scale and will eventually form part of an east-west link with Vickery State Forest once the Rocglen Coal Mine is rehabilitated (Principle 11 Offset must be located appropriately).

Further, consistent with Principle 8 (offset must be agreed to prior to the impact occurring), the offset package has been fully described and has been proposed as part of the Environment Assessment prepared for the Rocglen Extension Project and will be enforceable through project approval conditions (Principle 13). The proposed offset area is supplementary (Principle 12) and has not been used to offset other impacts or received any funding.

2.3.5 Mining Void – Unachievable and Uneconomic

It is proposed that the final void be backfilled to an elevation above 250m AHD, with an exception of about 38ha in the southern end of the pit where the surface levels will be in the range of 225-250 AHD. This will allow formation of surface water in the southern end of the pit which will increase in salinity over time.

The EA indicates that "consideration was also given to additional backfilling to reduce the depth of the void and bring it above the modelled long-term groundwater recovery level. However this was determined unachievable and uneconomic given the volume and cost of backfill that would be required".

Recommendation:

Further justification on what and why these factors are considered unachievable and uneconomic should be provided.

The original Rocglen Coal Mine development, as approved under PA 06_0198, included a final landform comprising a final void with a depth of approximately 230-235 metres AHD. The groundwater modelling undertaken at that time by RCA Australia (2007) predicted a 75 percent recovery in groundwater levels within approximately 7 years of project completion, and the remaining 25 percent over the following 100 years. While RCA Australia's report does not provide actual heights, it appears a 75 percent recovery would return the groundwater level to approximately 192 metres AHD, and 100 percent recovery would return the groundwater level to approximately 255 metres AHD.

On this basis, it was expected that the final void would incorporate some inflow of groundwater, with the depth well below the groundwater recovery level. Figure 2.14 in the original EA (R.W. Corkey & Co. 2007), which is contained in **Appendix B**, illustrates the final landform and clearly identifies and labels the predicted final groundwater recovery level at 255 metres AHD. There is no commitment in the original EA to backfill the void to above the predicted groundwater recovery level.

During the preparation of the EA for the Rocglen Extension Project, consideration was given to a range of alternative final landform and final void configurations based on known geotechnical issues and minimising the dimensions of the void to be retained. In response to submissions received following Adequacy Review of the draft EA, considerable effort was afforded to minimising the size of the final void and improving the location and configuration of the final void (including appropriate battering of the low walls and highwall) within the constraints of mine planning and mine optimisation.

It is proposed that the majority of the void will be backfilled to above 250 metres AHD, with the exception of an area in the southern end where surface levels will range between 220 and 250 metres AHD, which is consistent with the void elevations approved for the original Rocglen project. Figure 21 from the Rocglen Extension Project EA, which is contained within **Appendix C,** presents the conceptual post-mining landform.

The groundwater modelling for the Rocglen Extension Project undertaken by Douglas Partners (2010) predicts the final equilibrium groundwater levels in the void will be in the order of 220 to 245 metres, however this may take anywhere up to 50 years and would also be influenced by on-going climatic conditions. Douglas Partners also conducted modelling to determine the final surface level required to avoid any surface water forming in the void, which was determined to be around 275 metres AHD. This level is above the pre-development groundwater level and the final equilibrium level as Douglas Partners took into consideration the permeable and porous nature of the mine spoil, with recharge rates into the spoil higher than for the surrounding undisturbed ground.

This surface level, again noting that it is well above the pre-development groundwater level and the final predicted equilibrium groundwater level, is impractical and uneconomic to achieve from a mine management perspective. In considering a final fill level of 275 metres AHD, the following issues were identified:

- In order for the mine to operate, with ramps to the lowest level in the pit, void space of at least 15 million cubic metres (Mm^3) is required. If at least 80 percent of the void space is below 275 metres AHD, up to 12Mm^3 of overburden will need to be stockpiled outside the pit for later rehandle and replacement in the void. Currently, the Western Emplacement Area is nearing capacity, and the overburden cannot be stored in the footprint of the open cut to avoid rehandle. As a consequence, storage to the Northern Emplacement Area would be the only available option which would then require significant haul length and costs to rehandle and place back in the pit. From a mine development perspective, the maximum need for mine space is in the next two years, thereby exacerbating the need for the overburden to be established in the Northern Emplacement Area.

- Sourcing the backfill material from the Northern Emplacement Area to reduce the void depth and bring it up to around 275 metres AHD would be an mammoth and expensive exercise at the completion of mining. Whitehaven has calculated, based on today's dollar, that to rehandle the material from the Northern Emplacement Area into the final void area would cost around $3.50 per m^3 (including a contingency factor). This is based on today's costs in equipment requirements and operational support as follows:
  - One 350 tonne digger @ $800 per hour;
  - Three 150 tonne rear dump trucks @ $1,350 per hour;
  - One D11 dozer @ $400 per hour;
  - One 16H grader @ $350 per hour;
  - One water cart @ $150 per hour;
  - One open cut examiner @ $120 per hour; and
  - Overheads (e.g. project manager, vehicle, site facilities) @ $100 per hour.

Total Cost = $3,270 per hour.

With up to 12Mm^3 of overburden required to backfill the void to around 275 metres AHD and assuming a production rate of 1,100 m^3 per hour, this equates to approximately $42 million (including a contingency factor). On top of this would be additional rehabilitation costs due to the need to obtain material from the Northern Emplacement Area, which is intended to be completely shaped and rehabilitated in Year 6 of the Rocglen Extension Project (5 to 6 years prior to completion of mining).

Furthermore, Whitehaven have calculated that with one 350 tonne digger this exercise would take approximately 2.3 years working double shift. If the capacity was doubled, it would take just over 12 months provided sufficient equipment could be sourced.

- As outlined in the EA, early re-shaping and revegetation of the external batter slopes of the Northern Emplacement Area will be undertaken in Years 1 and 2 of the expanded operation to minimise visual impacts, limit erosion and downstream sedimentation, and minimise the projection of noise from overburden transportation and emplacement activities towards privately owned residences located to the north and north-east later in the mine life. Overburden will be progressively dumped inside of the established extremities of the emplacement footprint using lifts to gradually raise it to its design height. By Year 6 (5 to 6 years prior to completion of mining), dumping in the expanded Northern Emplacement Area will be completed and the landform will be reshaped, topdressed and revegetated.

  A requirement to obtain backfill material at the end of mine life from the Northern Emplacement Area would not only raise significant expense and impracticality issues associated with double handling, it would also significantly delay rehabilitation works on this overburden area, thereby increasing on-going visual amenity impacts and dust and noise emissions.

When considered in the context of the estimated capital investment value of the extension project of $1.7 million, and the final landform design of the existing approved project, this requirement would seriously jeopardise the viability of the Rocglen Extension Project proceeding from both an economic perspective and a mining operations perspective.

2.3.6 Mining Void – Mine Spoil Management

The EA indicates that a final fill level of 275m AHD is required to prevent surface water from occurring, which would also be above the pre development groundwater level. It is noted that "Such a high final ground level, well above pre-development groundwater levels, is understood to be impractical from a mine spoil management perspective".

Recommendation:

Further justification on what these impracticalities for mine spoil management are should be provided.

The impracticalities from a mine spoil perspective relate to the inability to store the required amount of backfill in and around the pit for subsequent filling of the void to bring the depth up to 275 metres AHD. The pit and overburden development sequence relies on material at the outer edge of the Northern Emplacement Area for early re-profiling and revegetation to enable visual and acoustic shielding.

There is currently no available space to store the material in the Western Emplacement Area, and a requirement to obtain backfill material at the end of mine life from the Northern Emplacement Area would not only raise significant expense and impracticality issues associated with double handling, it would also significantly delay rehabilitation works on this overburden area, thereby increasing on-going visual amenity impacts and dust and noise emissions.

Please refer above to **Section 2.3.5** for further discussion in this regard.

2.3.7 Mining Void – Emplacement Areas

It is noted the proposed expanded Northern Emplacement Area and the approved Western Emplacement Area are both proposed to have a maximum design height of approximately 50m above pre-mining landform. No consideration has been provided within the EA to place some of this material within the southern end of the pit.

Recommendation:

Further justification on why this option has not been considered within the EA should be provided.

As per the reasoning outlined above in **Sections 2.3.5** and **2.3.6**.

2.3.8 Mining Void – Groundwater Sink

The final void design does not meet mining best practice as it will become a permanent and ongoing liability to the State of NSW. The void will act as a permanent groundwater sink, resulting in groundwater losses to evaporation and water within the void becoming saline over time.

The Office expects that the final void footprint is minimised and that the depth of the void is at least above the final groundwater recovery level such that a permanent groundwater sink is not developed. The final void and landform should also consider opportunities for integration of boundary development across adjacent mining operations and to potentially utilise final void space across the mines.

Recommendation:

Modify final landform, mine planning and final void design to minimise void area and depth. Ideally the mine should be designed to meet the world best practice and avoid any final mining void.

Please refer to the information provided above in **Sections 2.3.5** and **2.3.6**.

The original Rocglen Coal Mine development, as approved under PA 06_0198, included a final landform comprising a final void with a depth of approximately 230-235 metres AHD. As outlined above in **Section 2.3.5**, it was expected that the final void would incorporate some inflow of groundwater, with the depth well below the predicted groundwater recovery level. Figure 2.14 in the original EA (R.W. Corkey & Co. 2007) illustrated the final landform and clearly identifies and labels the predicted final groundwater recovery level at 255 metres AHD. There is no commitment in the original EA to backfill the void to above the predicted groundwater recovery level.

While mining best practice may be to fill the void, this is idealistic and we are unaware of any examples within NSW where this has been achieved. The imposition of no final void would have significant implications on the viability of the project as a whole and would place the Rocglen operation at a distinct cost disadvantage compared to other mining projects in NSW. The mine design, as presented, has sought to minimise the dimensions of the final void. In response to submissions received following Adequacy Review of the draft EA, considerable effort was afforded to minimising the final void and improving the location and configuration of the final void (including appropriate battering of the low walls and highwall) within the constraints of mine planning and mine optimisation. This included committing to backfilling the majority of the void to an elevation above 250 metres AHD, with the exception of an area in the southern end where surface levels will range between 220 and 250 metres AHD, which is consistent with the void elevations approved in the original Rocglen development.

Groundwater inflow to the pit will be offset by evaporation from the area of surface water and therefore it is unlikely that the groundwater levels within the pit will ever fully recover to pre-development levels. Douglas Partners (2010) estimates that the final equilibrium water levels will range between 220 and 245 metres AHD, which indicates that the level of groundwater inflow into the void is likely to be minor.

Douglas Partners (2010) states that the existing groundwater in the Maules Creek Formation is generally brackish with total dissolved solids in the range 1,000 to 5,130 milligrams per litre. In general, the pore water in the backfilled mine spoil is expected to become less saline over time due to the percolation of rainfall through the spoil pile. The exception to this will be in the area of surface water in the non-backfilled portion of the pit. In this location, the salinity is expected to increase over time as the evaporation leads to a reduction in water volume and leaves the dissolved salt behind. The increase in concentration is expected to be generally isolated to the surface water in the locally deep area, with some minor mixing with the adjacent pore water in the mine spoil.

It is considered that, although the proposed final void form will, over time, lead to increasing salt concentrations in the localised area of surface water within the final void, this will be of minimal impact outside the final void for the following reasons:

- Any increases in salinity within the final void will not affect the surrounding groundwater quality as the flow will be towards the area of higher salinity and not away from it;
- The surface water level at equilibrium will be below surrounding groundwater levels; and
- The surface water will be located within a small final void area with relatively steep sloping sides. This small area will be unsuitable for alternative land uses which would be sensitive to the potential saline surface water.

Leaving the void as a stable landform with the possible additional use of a long-term water storage is, at this point in time, the preferred option. There may be additional appropriate land use options at mine closure, and in consultation with the relevant government agencies and stakeholders at that time, any such options will need to be assessed as appropriate.

2.4 NSW Office of Water

The submission received from the NSW Office of Water (NOW) provides detailed comments on surface water and groundwater associated with the Rocglen Extension Project. The submission states:

> *NOW does not object to approval being granted to the Rocglen expansion proposal, on the proviso that rigorous verification and accounting processes be formally imposed as conditions for any approval which is granted to the application.*

Attachment B of the submission provides recommendations for conditions of project approval.

2.4.1 Surface Water

The assessment of surface water associated with the Rocglen Extension Project was undertaken by GSSE as part of the *Surface Water Assessment* (2010c). Following a meeting with the NOW's Fergus Hancock on the 23 May 2011, GSSE's Chad Stockham (Associate Environmental Engineer) prepared the following response to the surface water issues raised by the NOW.

NSW Harvestable Rights Policy

NOW requires surface water runoff capture is quantified and accounted for in adherence with the NSW Harvestable Rights policy. Any surface water capture which is not within the definition of harvestable rights and/or exempt classes of water capture can only be taken in accordance with NSW water legislation.

The Surface Water Assessment prepared by GSSE (2010c) assessed the Rocglen Extension Project against the requirements of the *NSW Farm Dams Policy 1999.* In summary, this assessment found:

- All existing clean water storage dams that will be used for water supply are within the maximum harvestable right of the Project Site. On this basis, no licenses are required for these existing dams. At this point in time, there are no new clean water dams proposed for Rocglen;
- All existing and proposed dirty water dams (sediment basins) are exempt from harvestable right calculations under the *NSW Farm Dams Policy 1999*. The purpose of the dams is to prevent the contamination of downstream waterways. The Mine Water Dam is exempt for the same environmental purposes; and
- The Bore Water Dam, which will be used as a 'turkeys nest' dam to contain water pumped from the licensed groundwater bores, will not capture water from the natural catchment and is therefore exempt from licensing under the *NSW Farm Dams Policy 1999*.

Site Water Balance – Over-Prediction of Surface Water Capture

NOW has an ongoing reservation that the site water balance may significantly over-predict surface water capture to the operation, at the expense of the necessary diversion of clean catchment runoff and/or stream flows to catchment dams.

Section 7.0 of the *Surface Water Assessment* (GSSE 2010c) examines the site water requirements and available water storage against water availability to present a water balance for the Rocglen Project Site. Site water balance calculations were undertaken for the scenarios referred to as Years 1, 5 and 10 of the expended operation, and the results were based on dry, median and wet rainfall conditions.

The detailed site data available for 2008, 2009 and early 2010 enabled the water balance model to be calibrated to closely match the recorded site conditions during this period. The model was calibrated primarily via adjusting the runoff coefficients in order to achieve runoff volumes that provide water balance results mimicking recorded and observed conditions. These calibrated runoff coefficients were used for the modelling of the predicted water balance scenarios.

Given the high quality of site data and good model calibration, GSSE is confident that the results of the model are an accurate reflection of the probable water balance to be experienced. It is considered that the site water balance for the three scenarios (Years 1, 5 and 10) provides an appropriate representation of the range of conditions likely to be experienced across the site throughout the Project Life.

With regard to the clean catchment runoff (and associated availability of water downstream), it should be noted that there is extensive diversion of clean water around the Rocglen Project Site into existing drainage lines off-site. The clean water runoff from the eastern catchment will be diverted either north into Driggle Draggle Creek or south into the central unnamed drainage line. This will result in a large area of clean catchment being diverted around the site and into the natural drainage system rather than being held in the site water management system. The clean water runoff from the west of the Project Site originating in the Vickery Sate Forest will also be either diverted north or south into the same drainage lines. As a result of the diversions, only runoff from lands within the site's proposed water management system will be contained for pollution control. This should help maintain ephemeral flows and sediment movement patterns in the watercourses downstream of the Project Site.

In addition, it is anticipated that regular controlled discharge of treated water from the Project Site will be undertaken in accordance with approval and licensing conditions. This will further assist with the maintenance of flows and water availability to downstream catchments and users.

It is also important to note that the Rocglen operation has a relatively low water supply requirement, primarily due to the lack of an on-site coal washery (with inherent water demand). The low water consumption significantly reduces the potential to impact on downstream water availability.

Site Water Balance – Range of Climate Conditions Considered

NOW requests a review of the mine site water balance based on the range of climate conditions which may occur, including drought conditions similar to that experienced in recent years.

A review of the site water balance is not considered necessary as the balance presented within the Surface Water Assessment (GSSE 2010c) included analysis of a range of climatic conditions. Specifically, 109 years (1990 to 2008) of rainfall data was utilised from the Bureau of Meteorology's weather station at Boggabri. The site water balance model was run for the full 109 years of data available for each scenario of Years 1, 5 and 10 of the expanded mining operation. The results of this continuous model were reviewed and analysed to show probable water balance results. In order to predict results for a probable dry year (10th percentile), median year (50th percentile) and wet year (90th percentile), a summary of the annual water balance results was produced from which trend-lines were approximated and used to estimate dry/median/wet year results.

As stated above, given the high quality of site data and good model calibration, GSSE is confident that the results of the model are an accurate reflection of the probable water balance to be experienced. It is considered that the site water balance for the three scenarios (Years 1, 5 and 10) provides an appropriate representation of the range of conditions likely to be experienced across the site throughout the Project Life.

Diversion of Third Order Watercourse

The application area extends into a weathered rock aquifer connected to an unnamed watercourse which drains to the Namoi River…..

The information presented does not present details on diversion of the third order unnamed watercourse. As the diversion of this watercourse would require a water management works approval if not authorised under a project approval under Part 3A of the EPAA, NOW requires additional details regarding the construction, maintenance and completion criteria to the proposed diversion.

A condition has been recommended (Attachment B) for these investigations to be completed and supplied to NOW for review prior to approval of the Site Water Management Plan (SWMP).

The Surface Water Assessment (GSSE 2010c) did not identify any third order water courses to be impacted upon by the Rocglen mining operation. Section 6.7.1 of the assessment advises the following:

The following drainage lines will be impacted on by the Project:

- *The head waters of Driggle Draggle Creek (first order);*
- *Upper section of the central drainage line (second order);and*
- *An approximate 125 m section of the central drainage line immediately below the existing approved open cut limit.*

In the meeting on the 23 May 2011 between GSSE's Chad Stockham and the NOW's Fergus Hancock, stream ordering drawings were reviewed and it was confirmed and agreed that there are no third order watercourses to be diverted or impacted. Subsequently, a water management works approval will not be required, regardless of whether the Project is under Part 3A of the EP&A Act or not.

On this basis, the requested additional details regarding the construction, maintenance and completion criteria of the proposed diversion are not relevant or warranted, and the recommended condition titled 'Surface Water Investigation' should not be included within the Project Approval.

As detailed in Section 6.7.2 of the *Surface Water Assessment* (GSSE 2010c), Whitehaven is committed to undertaking significant rehabilitation works to achieve a long-term enhancement of the ecological value of the drainage lines through the restoration of natural hydraulic conditions and appropriate revegetation of a riparian corridor. The rehabilitation program, including key design elements, will be detailed within the Site Water Management Plan to be revised following Project Approval.

Water Supply and Water Balance

NOW has experienced difficulties in determining the likely and potential volumes which will be intercepted and/or displaced, and thus determining volumetric licensing arrangements which will apply to the proposal. As a result, NOW requires accurate reporting of water balances predicted and actual and that all groundwater extracted is licensed. Conditions regarding the reporting site water balances have been recommended in Attachment B.

The requirements of the proposed condition regarding the reporting of water supply, site water balances and water management will be incorporated into the Site Water Management Plan to be revised following Project Approval.

2.4.2 Groundwater

Douglas Partners, who prepared the *Hydrogeological Assessment* (2010) for the Rocglen Extension Project, was engaged to respond to the groundwater issues raised by the NOW. A copy of Douglas Partners' response is contained within **Appendix D** and summarised below.

NOW notes that Rocglen possesses a licence under Part 5 of the *NSW Water Act 1912*, which is required to be maintained to ensure groundwater abstracted during mining operations is appropriately accounted for and authorised. NOW indicates that this license does not authorise any abstraction or displacement of groundwater from an alluvial groundwater source administered under the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* (WSPULNGWS) and the proponent must not intercept or displace any water from the WSPULNGWS without obtaining shares and an access licence to cover any water loss from this system and manage their impacts.

NOW requires that the groundwater verification process include mapping of alluvial boundary to the Upper Namoi alluvium, including a clearly defined setback distance from the edge of the mapped alluvium. NOW also identifies the need for further examination of long term impacts to local groundwater resulting from the Rocglen operation and additional groundwater predictive assessment work.

In response, Douglas Partners provides the following discussion:

Existing Licence Conditions

The existing groundwater interference licence include the following conditions:

- Prepare and implement a groundwater monitoring program, in consultation with DECCW, NOW and DOP to include:
  - further detailed development of the regional and local groundwater model;
  - detailed baseline data to benchmark the natural variation in groundwater level, yield and quality;
  - groundwater impact assessment criteria;
  - program to monitor the impact of the project on groundwater level, yield and quality; and
  - procedures for reporting the results of the monitoring.
- Prepare groundwater management plan;
- Prepare groundwater contingency plan including trigger levels;
- Undertake remedial action if available drawdown attributable to mining is reduced by over 10%;
- Monitor the surface water level and saturated thickness and water quality of the following registered bores:
  - GW050395, GW050166, and GW011066 on the Glenroc Property;
  - GW045621 on the Yarrawonga Property;
  - GW044068 and GW044069 on the Yarrari Property;
  - GW022319 on the Roseberry Property; and
  - GW013369 on the Brolga Property.

Site Water Management Plan

The existing Site Water Management Plan addresses issues in the licence conditions and includes a groundwater monitoring program comprising the following elements:

- Further development of the regional and local groundwater model;

- Detailed baseline data to benchmark the natural variation in groundwater levels, yield and quality (including at any privately owned bores in the vicinity of the site);
- Groundwater impact assessment criteria;
- A program to monitor the impact of the project on groundwater levels, yield and quality; and
- Procedures for reporting the results of this monitoring.

The groundwater monitoring program also comprises groundwater contingency measures.

Previous Recommendations of Douglas Partners

The *Hydrogeological Assessment* (Douglas Partners 2010) indicated that there is some uncertainty in the site conditions, in particular to the south west of the site, and pit inflows of greater than 700 megalitres per year may be possible if adverse conditions occur. The modelling also includes that a proportion of pit inflows may come from the NGWS (Namoi Alluvium). ON this basis, a robust on-going monitoring program and updating of the predictive model were recommended as mining continues, to clarify the potential impacts on the NGWS.

Douglas Partners (2010) recommended the following to improving groundwater monitoring at the site:

- The aquifer interval monitored by each of the bores is not known with certainty. Bores should be cleaned out (air-lift developed) and depth checked with a weighted tape. Bores should then be geophysically wireline logged (SP/SPR and Gamma) to confirm slotted intervals and the nature of the strata over slotted intervals;
- All monitoring bores should be surveyed for location and level (both ground level and the level of the Reference Point (RP) from which groundwater levels are measured);
- Monitoring of groundwater levels should initially be undertaken on a monthly basis for the first year of the expansion, after which the monitoring interval could potentially be relaxed subject to review of the results. In the longer term a monitoring interval of three months is anticipated. The monitoring should be undertaken in the first week of the nominated month. The frequency of groundwater sampling and laboratory analysis of water samples should remain as is. Water samples should be analysed for all major ions, including carbonate; and
- Pressure transducers/dataloggers should be installed in monitoring bores MP-01 to MP-05 for the continual recording of groundwater levels. These instruments should be downloaded every two months. In the case of MP-04 and MP-05, these wells only just intersected the water table when installed and have been observed to run dry. It is recommended that these bores be deepened to at least 10 metres below the water table.

The following program of investigations was recommended to clarify uncertainty with regard to the proximity of alluvium to the south the site:

- Bores MP-04 and WB-01 are nominally located within the alluvium south and north of the mine, respectively. Once this is confirmed through the activity recommended above, a second bore should be drilled adjacent to both of these bores to a depth at which the base of the alluvium is intersected. The adjacent bores should be completed as monitoring bores in the Maules Creek Formation and have a pressure transducer/datalogger installed for continuous water level monitoring; and
- There is some uncertainty regarding the nature of the interface between the southern alluvium and the weathered conglomerate profile of the Maules Creek Formation at the southern end of the proposed pit. It is recommended that a pair of piezometers be installed immediately to the south of the proposed pit, one in the Belmont Seam and one in the alluvium/weathered conglomerate. It is also recommended that hydraulic testing be undertaken on the bore in the alluvium/weathered conglomerate to allow refinement of the groundwater model in this regard.

The report (Douglas Partners 2010) indicated that regular monitoring of both MP-04 and WB-01, the new piezometers immediately to the south of the pit and their adjacent bores will assist in assessing the degree of hydraulic connection between the Maules Creek Formation and the alluvial aquifer.

These recommendations to improve groundwater monitoring are included in the Statement of Commitments in the EA for the Rocglen Extension Project.

Comments

In review of the proposed consent conditions by the NOW, Douglas Partners believes that many of the proposed conditions are already part of the groundwater licence conditions and included in the existing water management plan. Douglas Partners has identified some deficiencies in the existing groundwater monitoring program and, as such, has recommended improvements to the existing groundwater monitoring regime and refinement of the existing groundwater model (as required). These recommendations are expected to cover most of consent conditions proposed by the NOW. The improved monitoring regime can be used to clarify potential impacts on the NGWS (Namoi Alluvium) and determine what future groundwater abstraction licensing arrangements are required.

During the preparation of the revised Site Water Management Plan, Whitehaven will liaise with the NOW to discuss improvements to the groundwater monitoring program. Douglas Partners believe that the proposed improvement measures are considered adequate at this stage.

Douglas Partners considers that updating of the groundwater model would only be required in the following instances:

- Additional investigations with regard to the proximity of the alluvium to the south of the site indicates conditions significantly different to those adopted for the modelling; and/or
- The results of groundwater monitoring show significant departures from the predictions presented to date.

2.5 NSW Department of Trade and Investment, Regional Infrastructure and Services

The submission received from the Minerals Resources Division of the NSW Department of Trade and Investment, Regional Infrastructure and Service (DTIRIS Minerals Resources) concludes that it has no objection to the proposal and recommends that if approved the proponent include the proposal into the environmental management and rehabilitation process and Mining Operations Plan for the mine site.

2.5.1 Mining Title

DTIRIS Mineral Resources require that all mining and mining purpose activities are contained within the mining leases for the project. The project is within Mining Lease 1620 and Mining Lease Application 395 held by Whitehaven Coal Mining Pty Limited.

Rocglen currently operates within the mining lease identified as ML 1620. The Rocglen Extension Project will extend mining-related activities outside the bounds of ML 1620. On this basis, Whitehaven has lodged Mining Lease Application 395 with the DTIRIS, and, if approved, will revise statutory mining documents, such as the Mining Operations Plan (MOP), as appropriate.

2.5.2 Rehabilitation and Mine Closure

DTIRIS Mineral Resources acknowledges that a considerable effort has been undertaken by the proponent in assessing rehabilitation planning and mine closure issues. The EA has identified broad post mining land uses and landforms, rehabilitation principles and objectives, and preliminary closure (success) criteria.

DTIRIS has no objection to the proposal and recommend that if approved the proponent include the proposal into the environmental management and rehabilitation process and Mining Operations Plan for the mine site.

Whitehaven is committed to integrating the Rocglen Extension Project into the comprehensive suite of environmental management plans and monitoring programs currently implemented at Rocglen in accordance with the current Project Approval (PA 06_0198) and Environmental Protection Licence (EPL 12870). To this end, please refer to the Statement of Commitments detailed in Section 8.0 of the EA.

Furthermore, Whitehaven has scheduled the revision and update of the current Rocglen MOP, which was prepared in 2008 following receipt of the current Project Approval, in order to incorporate the proposed Rocglen Extension Project. Revision of the MOP will be undertaken in accordance with the *Guidelines to the Mining, Rehabilitation and Environmental Management Process* (NSW Department of Primary Industries 2006) and will include updating of the security bond calculation for the largest disturbance footprint within the MOP period.

2.6 NSW Heritage Branch

The submission received from the NSW Heritage Branch focuses on the opinion that non-Aboriginal heritage has not been adequately assessed as part of the EA process.

The assessment of non-Aboriginal heritage associated with the Rocglen Extension Project was undertaken by RPS as part of the *Cultural Heritage Survey and Assessment* (2010b). RPS concluded that there are no known potential historic or archaeological elements in proximity of the Project Site.

RPS was also engaged to prepare a response to the submission received from the NSW Heritage Branch. A copy of RPS's response is contained within **Appendix E** and summarised below.

2.6.1 "Glenroc" Residence

Section 5.9.4 of the EA states that it is likely that the unoccupied 'Glenroc' residence further to the north of the 'Glenroc' outbuildings, whilst outside of the proposed disturbance areas, will also be removed as part of the project works. There is no justification provided for this decision in either the EA or the RPS Report.

The "Glenroc" property owned by Whitehaven and located in the northern extent of the Project Site, encompasses an unoccupied residence and several outbuildings. The Rocglen Extension Project proposes the removal of the "Glenroc" outbuildings in order to cater for the expanded Northern Emplacement Area.

Given that the distance between the proposed Expanded Northern Emplacement Area and the unoccupied "Glenroc" residence is only around 100 metres, it is likely that the dwelling will be removed for operational and safety reasons. Whitehaven would prefer to see a buffer of over 100 metres around the Northern Emplacement Area to provide for surface water management and vehicle manoeuvring in the periphery of the Emplacement, as well as adequate area to enable rapid response to ameliorate any stability issues. Given the close proximity of the residence, it could not be occupied on the basis of safety and amenity for the residents.

2.6.2 Definition of a Relic

Section 1.3.2 erroneously describes the definition of a 'relic' under the NSW Heritage Act as "any deposit, object or material evidence relating to the settlement of the area that comprises NSW, not being an Aboriginal settlement, and which is fifty or more years old". This definition is incorrect. The Heritage Act was amended in 2009 and this definition has changed as part of those amendments.

RPS concurs with the NSW Heritage Branch in relation to the erroneous definition of a relic provided in Section 1.3.2 of the *Cultural Heritage and Survey Assessment* (RPS 2010b). Section 4 of the *NSW Heritage Act 1977* offers the following definition for a relic:

> *"relic" means any deposit, artefact, object or material evidence that:*
>
> *(a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and*
>
> *(b) is of State or local heritage significance.*

2.6.3 Non-Aboriginal Heritage

The Executive Summary of the RPS Report states that no European cultural heritage sites were identified during the survey of the project site, however in Section 7.5 (Survey Results) the associated outbuildings of 'Glenroc' are described as being part of the subject site.

In Section 9 − 'European Heritage Significance Assessment', there has been no assessment of the significance of 'Glenroc' using the accepted significance criteria outlined in the 2001 NSW Heritage Council endorsed 'Assessing Heritage Significance' guidelines. The assessment of significance in the RPS Report merely states that the 'Glenroc' buildings are not considered significant.

In their assessment of non-Aboriginal heritage associated with the Rocglen Extension Project, RPS concluded that there are no known potential historic or archaeological elements in proximity of the Project Site and there are no items on the State Heritage Register, State Heritage Inventory or State Heritage Database.

RPS inspected the "Glenroc" residence and associated outbuildings, fences and structures within the Project Site to determine if they were of heritage significance. RPS considered that the residence was most likely constructed in the early to mid twentieth century and there was no evidence of an earlier house or buildings. RPS concluded that the "Glenroc" residence and associated outbuildings are not considered to have any historic significance and no other items of European heritage significance were observed.

Plate 1 – Unoccupied "Glenroc" Residence

In response to this issue, RPS has advised the following (see **Appendix E**):

> *The Glenroc residence and outbuildings were thoroughly investigated and assessed for potential heritage significance. Essentially the Glenroc residence is a mid 20th century weatherboard construction in what could be loosely described as 'vernacular' in style. It is neither architecturally unique, nor does it hold any heritage value. It was therefore not assessed for significance under the NSW Heritage Branch Significance Assessment Criteria. Furthermore, RPS stands by our comment that no European heritage sites were identified during the field survey. Following an inspection of the residence and outbuildings in question they were deemed to be not European cultural heritage sites. This assessment was based on the expertise of RPS Senior Archaeologist, Laraine Nelson, compiler and author of Historic Homesteads of the Muswellbrook District (Nelson & Tame) for the Muswellbrook and Upper Hunter Historical Society. This document was the base document for European heritage investigation for Upper Hunter coal expansion and is still in use.*

Taken at face value, the Heritage Branch correspondence appears to indicate that any European structure encountered is a European cultural heritage site, which is clearly not the case. RPS did not conduct a significance assessment because the residence and outbuildings were not deemed to be of heritage status.

The proposed draft Statement of Commitment for European Heritage (8.15) is not robust enough to ensure the protection of any non−Aboriginal heritage within the project boundaries. This should be revisited and guided by the new significance assessment on the identified non−Aboriginal heritage within the project boundaries.

In response to this issue, RPS has advised the following (see **Appendix E**):

The standard recommendation provided by RPS for the Rocglen expansion project, which is included in the Statement of Commitments in Section 8.0 of the Environmental Assessment, is considered adequate due to that fact that the buildings in question and across the rest of the project area are not European heritage items, nor are any items of European heritage likely to exist within the project area. Consequently, a written heritage significance assessment that would guide the proposed project expansion works would be meaningless as there is nothing of heritage significance to assess.

2.7 NSW Roads and Traffic Authority

The RTA would have no objection in principle to the proposed mine extension, providing the following issues are fully considered:

i The RTA has not received any advice to confirm that its previous concerns in its letter 10 August 2010 have been adequately addressed.

ii The proposed additional 120 B-Double, service and employee traffic movements will have a cumulative impact on the safety and efficiency of the road network.

iii The impacts on the existing right-turn storage on the Kamilaroi Highway need to be investigated and the storage increased if required.

iv Any necessary road works on the Kamilaroi Highway will require a Works Authorisation Deed (WAD) with the RTA.

These comments indicate that the RTA has not comprehended the scope of the Rocglen Extension Project nor recollects the RTA's original advice provided to the then DoP in a letter dated 15 February 2010.

As outlined in the EA and previously expressed to the RTA in a letter dated 1 March 2011, the Rocglen Extension Project does not involve any change to the coal production rate, transport fleet, hours of coal haulage or traffic generation volumes/movements. Furthermore, the coal haulage route used between Rocglen and the Whitehaven CHPP will remain as approved and constructed under the provisions of the current Project Approval PA 06_0198. On this basis, the Project does not pose any additional annual impacts upon the local road network or traffic volumes, nor does it pose any additional conflict with non-mine related traffic using the haul route.

The Project will result in an extension to the life of the Rocglen operation, which will necessitate on-going coal transport for a number of years beyond what was originally approved under PA 06_0198. The use of the road network for this extended period will be covered under the arrangements of the existing road maintenance agreement with Gunnedah Shire Council to ensure the subject roads continue to be adequately maintained.

On the 15 February 2010, the RTA prepared the following written advice to the then DoP (see Appendix E of the EA) in response to initial consultation regarding the Rocglen Extension Project:

> *At present road works are about to commence for the Kamilaroi Highway and its junctions with Blue Vale Road and the Coal Loader Road to cater for the impact of the existing approved mines that use this route, as required by the previous conditions of consent.*
>
> *As it appears that there will be no increase in traffic generation the previous conditions would be adequate for the proposed extension to the mine.*
>
> *At this time the RTA does not envisage that any further road works will be required on the Kamilaroi Highway for the proposed development.*

On this basis, we do not believe the issues raised by the RTA require any further attention.

2.8 Namoi Catchment Management Authority

The submission received from the Namoi CMA focuses on the opinion that the broad catchment and management targets within the Namoi Catchment Action Plan (CAP), along with a number of specific issues, have not been adequately considered within the EA. The Namoi CMA requests additional detail on how the Rocglen Extension Project will improve and/or maintain the catchment by either contributing and/or impacting on catchment assets, especially with regard to natural landscapes, native plants and animals, and surface and groundwater systems.

2.8.1 Namoi Catchment Action Plan

It appears that the Rocglen development will result in changes to Namoi's CAP Management Targets especially with regard to changes in land capabilities and their resultant landuse. Additionally, there may be an interception of groundwater within the final void, while there appears to be a significant improvement in native vegetation extent. We would like the relevant Catchment and Management Targets contained in the Namoi CAP to be thoroughly considered and details provided on how they will be impacted and/or enhanced.

The EA prepared for the Rocglen Extension Project includes a comprehensive and relevant assessment of the four catchment resources identified in the Namoi CAP, these being:

- The landscape;
- People and their communities;
- Native plants and animals; and
- Surface and groundwater ecosystems.

While not addressed specifically under these headings or specifically in terms of the CAP's catchment and management targets, the EA provides a thorough account of the existing environment and a detailed assessment of the potential for the Rocglen Extension Project to impact or influence these assets. Furthermore, the EA included:

- An overview of the existing proactive strategies employed at Rocglen to avoid, minimise, mitigate, offset or manage potential impacts;
- The development of appropriate and long-term beneficial post-mining landforms and land uses;
- A commitment to review and update the suite of environmental management plans and monitoring programs already implemented at Rocglen; and
- A comprehensive Statement of Commitments.

On this basis, we believe that the overall intent and relevant targets of the Namoi CAP are adequately and appropriately addressed within the detailed assessment and reporting contained within the EA.

2.8.2 Soil Stripping and Stockpiling

Namoi CMA concurs with Whitehaven's general practice of placing a minimum of 100mm of subsoil on top of overburden prior to topsoiling to a minimum of 100mm. Notwithstanding this, we would like to see, where possible, the depth of subsoil and topsoil increased further. We would also recommend that the final batter grades within the void be subsoiled and topsoiled to at least the minimum standards.

Whitehaven has adopted the general practice of including an intermediate layer of subsoil between the overburden material and the topdressing, which improves the water holding capacity of the rehabilitated landform and reinstates a more natural soil profile. This practice is proposed to continue at Rocglen using appropriate subsoil and targeting areas being rehabilitated to pasture. For areas being rehabilitated to bushland, Whitehaven may preferentially reduce the subsoil replacement depth and/or exclude subsoil replacement in selected areas to establish trial areas to monitor bushland development in different soil profiles.

Where resources allow, topsoil and subsoil will each be spread to a nominal depth of between 100 to 150 millimetres, giving a combined depth of soil material on the rehabilitated landform of between 200 and 300 millimetres. While Whitehaven will aim to increase the depth of material spread, this will be dependant on the volume of suitable material available throughout the progressive rehabilitation process.

In general the topdressing material is sourced from the upper horizon (topsoil) and the intermediate layer is sourced from the lower horizons (subsoil). Structural and textural properties of subsoils, dispersion potential, sodicity and acidity/alkalinity are the most common and significant limiting factors in determining the depth of soil that is suitable for reuse.

Adherence to the stripping depths recommended within the EA, and allowing for a 10 percent handling loss, will yield approximately 559,400 cubic metres of topsoil material suitable for topdressing and 480,200 cubic metres of subsoil material suitable for intermediate layering between the overburden and topdressing. Based on these volumes and the estimated area of land to be disturbed within the Project Site of approximately 358 hectares, sufficient material will be available to enable effective intermediate layering and topdressing for the rehabilitation of the site.

2.8.3 Final Void

Namoi CMA is concerned that there will be a significant final void (65 ha - 18% of the anticipated disturbance area) left once mining is complete. The void will have batters ranging from 10^{o} to 45^{o} (18% to 100%) slopes. Also Namoi CMA believes that it is unacceptable to leave a 5 ha high-wall with 45^{o} batters. It is noted that the EA states in subsection 5.7.8, that the high-wall will be assessed by a geotechnical engineer to determine its post mining stability. However, the high wall may be assessed as being geotechnically sound in accordance with the factors listed on Page 56, but this does not mean that its long term land use and landscape function is acceptable.

As there was no void present prior to mining on this site, Namoi CMA seeks the following:

- ***void be minimised in area as much as possible.***
- ***final batters on all slopes be no greater then 10^{o} (18%).***
- ***final void batters be topsoiled and rehabilitated to permanent pasture.***
- ***suitable soil conservation measures be installed within the void area to prevent soil erosion.***

It is noted that the EA states that it is un-achievable and un-economic to back-fill the void to reduce the depth of the void and improve void stability, however this is considered less than satisfactory as there is plenty of overburden material in the "out of pit emplacements" especially given the final void will exist forever following the cessation of mining.

The argument presented seeks on one hand a commitment to reduce the batter angles of the void slopes, while also asking that the final void area be minimised. It is impossible to achieve both. Any action to reduce internal void slopes will require a larger void footprint in order to lay the batter angle back.

The original Rocglen Coal Mine development, as approved under PA 06_0198, included a final landform comprising a final void with a depth of approximately 230-235 metres AHD (see **Appendix B**). There is no commitment in the original EA to backfill the void to above the predicted groundwater recovery level.

It is proposed that the majority of the void proposed under the Rocglen Extension Project will be backfilled to an elevation above 250 metres AHD, with the exception of an area in the southern end where surface levels will range between 220 and 250 metres AHD (see **Appendix C**), which is consistent with the void elevations approved in the original Rocglen development.

The imposition of no final void would have significant implications on the viability of the project as a whole and would place the Rocglen operation at a distinct cost disadvantage compared to other existing mining projects in NSW. The mine design, as presented, has already sought to minimise the dimensions of the final void. In response to submissions received following Adequacy Review of the draft EA, considerable effort was afforded to minimising the final void and improving the location and configuration of the final void (including appropriate battering of the low walls and highwall) within the constraints of mine planning and mine optimisation. This included committing to backfilling the majority of the void to an elevation above 250 metres AHD, with the exception of an area in the southern end where surface levels will range between 220 and 250 metres AHD, which is consistent with the void elevations approved in the original Rocglen development.

Please refer to the additional information provided above in **Sections 2.3.5** to **2.3.8**, which also includes discussion on the use of out of pit emplacement material to backfill the final void.

2.8.4 Post Mining Landuse

Namoi CMA believes that the post mining land uses are acceptable, especially if the above final void recommendations are adhered to and that no high wall exists in the final landform.

As stated in the EA, 58% of the anticipated disturbance area will be returned to rehabilitated bushland, which as depicted in Figure 21 will stretch around the northern reaches of the final void area and towards Wean Road. Namoi CMA would like to see a defined link between this rehabilitated bushland and the Whitehaven Regional Biobanking Site. It appears from Figure 21 that this link will consist of a narrow road and riparian corridor. We recommend that a 400m wide corridor centred on the existing road corridor be established to ensure connection between Vickery State Forest (Vickery CCA) and Kelvin State Forest (Kelvin CCA) and the Whitehaven Regional Biobanking Site. This 400m wide corridor would potentially add significantly to Whitehaven's Biodiversity Offset Strategy especially if the area was revegetated to White Box Grassy Woodland.

The area of land that the Namoi CMA would like to see established as a 400 metre wide corridor between the Project Site and the Whitehaven Regional BioBank Site is outside of the Rocglen Project Site and encompasses part of the "Roseberry" property which is not owned by Whitehaven (private ownership). This makes establishing such a corridor somewhat difficult. However, based on the below discussion, it is expected that the east-west link between the Vickery State Forest and the Kelvin State Forest will, over time, naturally regenerate and expand.

The Whitehaven Regional BioBank Site will be actively managed via a BioBanking Management Plan with in-perpetuity management funding and will have the highest level of conservation status outside of National Parks. Improvements in conservation values will be achieved through the cessation of current grazing and implementation of conservation management practices outlined in the BioBank Site Management Plan, including enhancement tree and shrub planting and weed control.

The large area within the Rocglen site proposed to be rehabilitated to bushland will blend in well with the retained remnant vegetation areas within the Project Site and create viable connections with the surrounding environment. In particular:

- The western area of the Project Site will be restored as rehabilitated bushland to link in with the existing remnant bushland to the west in the adjacent Vickery State Forest; and
- A corridor from the western rehabilitated bushland will extend between the Northern Emplacement Area and the final void to connect with remnant vegetation to the east of the Project Site and create an east-west link to the Whitehaven Regional BioBank Site and Kelvin State Forest.

Whitehaven are committed to an on-going monitoring and maintenance program throughout and beyond the operation of the Rocglen mine. Areas being rehabilitated will be regularly inspected and assessed against the long and short-term rehabilitation objectives. Where the rehabilitation success appears limited, maintenance activities will be initiated. These may include re-seeding and where necessary, re-topdressing and/or the application of specialised treatments such as composted mulch to areas with poor vegetation establishment. Tree guards will be placed around planted tube stock if grazing by native animals is found to be excessive. Maintenance will continue until such time as the objectives are met, although it is generally accepted that it will be at least five years beyond closure.

On the basis of the above discussion, and the fact that the Whitehaven Regional BioBank Site is less than 1,000 metres from the Project Site, it is expected that the east-west link between the Vickery State Forest and the Kelvin State Forest will, over time, naturally regenerate and expand.

Namoi CMA recommends that the final void batters be flattened and topsoiled with the result being a shallower void. A shallower void would have other long term post mining advantages in that it could be used for grazing as well as preventing any saline groundwater being intercepted by the void and subsequently evaporating resulting in a saline scald.

Please refer to the information provided above in **Sections 2.3.5** to **2.3.8** and **Section 2.8.3**.

2.8.5 Land Resources

Table 21 indicates that there is significant downgrading of land capability and hence landuse as a consequence of the mining activity at Rocglen. As commented above, Namoi CMA believes that it is unacceptable to have a significant area left as a steep unusable void. If the above recommended treatments for the final void are accepted then the land capability for the void area could be reassessed as Class VI land. The final rehabilitated area of Class VI land would be 292ha (63%) with no Class VII or Class VIII land which would be deemed as being acceptable.

Figure 21 in the EA currently indicates that the final void area (65ha) would be returned to 'Rehabilitated Pasture'. However, as this area has been currently assessed in the EA as being Class VII and Class VIII post mining then the recommended landuse for Class VII land is 'green timber' while the Class VIII lands should not be grazed. These land capability classes and land uses are converse to the proposed landuse of 'Rehabilitated Pasture'.

Similar to the logic applied for the Land Capability Assessment comments, the same logic can be applied to the Agricultural Suitability Assessment. For example, with a lower slope and shallower void the post mining suitability would be Class IV with no Class V.

Please refer to the information provided above in **Sections 2.3.5** to **2.3.8** and **Section 2.8.3** with regards to the configuration of the final landform, including mine planning and optimisation constraints and financial implications of adopting the recommended treatments for the final void.

The proposed post-mining landform has been designed to achieve a stable topography with consideration to financial feasibility, environmental outcomes and potential future agricultural production. The cost to infill or batter back the final void slopes to less than 10 degrees is not financially viable for the mine given the significant upfront costs in earthworks, haulage and rehandling large volumes of overburden, as costed against the low potential return on that parcel of land as a low intensity grazing area. The environmental outcomes that are potentially available for the final void if returned, as planned, to a stable area where grazing is limited, include low erosion rates, low sedimentation and potential ecological benefits associated with a non-grazing landform.

Whilst land capability Class VII is generally representative of land best protected by green timber, in the case of re-establishing vegetation following mining, pasture species are often used to stabilise surface material and protect against erosion on slopes greater than 10 degrees. In fact, planting and establishing grasses/pastures on final void low walls is a standard practice. These grasses/pastures are not intended to be grazed and have therefore been classified as land capability Class VII.

Given that the area is not intended to be grazed, it is expected, overtime, that the area will be naturally invaded by adjoining bushland vegetation.

2.8.6 Surface and Groundwater

Namoi CMA believes the assessment of the existing environment, water qualities, modelling procedures, safeguards and mitigation measures, and proposed monitoring activities are acceptable.

No response necessary.

Subsection 7.6.6 Mine Closure refers to groundwater quality and quantity within the EA planned void; however, if the above recommendations are adopted by the proponent, then the issue of groundwater seeping into the void will be negated.

Please refer to the information provided above in **Sections 2.3.5** to **2.3.8** and **Section 2.8.3**.

2.8.7 Flora and Fauna

Namoi CMA believes the assessment of vegetation communities, safeguards and mitigation measures and monitoring to be adequate.

No response necessary.

Namoi CMA recommends that an active role be taken with revegetating the Whitehaven Regional Biobanking Site and the proposed corridors linking the Vickery State Forest (Vickery CCA) and Kelvin State Forest (Kelvin CCA).

The Whitehaven Regional Biobank Site, which is shown on **Figure 2**, is in the final stages of registration by the OEH as a BioBank Site under Part 7A of the NSW Threatened Species Conservation Act 1995 and will provide for the long-term conservation of approximately 1,500 hectares of Whitehaven-owned land approximately 900 metres to the east of the Project Site.

It will be actively managed via a BioBanking Management Plan with in-perpetuity management costs held in a Trust, and will have the highest level of conservation status outside of National Parks via a BioBanking Agreement registered on the land title in-perpetuity. Improvements in conservation values at the Whitehaven Regional Biobank Site will be achieved through the cessation of current grazing and implementation of conservation management practices outlined in the BioBank Site Management Plan, including enhancement tree and shrub planting and weed control.

The Whitehaven Regional Biobank Site enhances and provides strategic conservation outcomes to the west of the Kelvin CCA Zone 2 Aboriginal Area and provides protection to vegetation types not well represented in the existing reserve system (White Box Grassy Woodland). It also enhances north-south connectivity on a regional scale and will eventually form part of an east-west link with Vickery State Forest once the Rocglen Coal Mine is rehabilitated.

The large area within the Rocglen site proposed to be returned to rehabilitated bushland will blend in well with the retained remnant vegetation areas within the Project Site and create viable connections with the surrounding environment. In particular:

- The western area of the Project Site will be restored as rehabilitated bushland to link in with the existing remnant bushland to the west in the adjacent Vickery State Forest (Vickery CCA); and
- A corridor from the western rehabilitated bushland will extend between the Northern Emplacement Area and the final void to connect with remnant vegetation to the east of the Project Site and create an east-west link to the Whitehaven Regional BioBank Site and Kelvin State Forest (Kelvin CCA).

2.9 Construction Forestry Mining and Energy Union

The Mining and Energy Division of the CFMEU undertook an evaluation of the proposed Rocglen Extension Project in its submission by comparing environmental risks against the currently approved project in conjunction with Whitehaven's commitments for safeguards/mitigation measures. The CFMEU did not raise any issues and concluded the following:

The Project Extension does not pose any notable social impacts over and above those assessed and approved. It is considered that the Project Extension builds on those attributes of the existing project approval.

The Union on balance supports the Rocglen Extension Project.

3.0 REFERENCES

Douglas Partners (2011) *Response to NSW Office of Water Comments Rocglen Coal Mine Extension Project*

Douglas Partners (2010) *Hydrogeological Assessment for Rocglen Coal Mine Extension Project*

Eco Logical Australia (2011) *Rocglen Coal Mine Extension Project - Biodiversity Offset Strategy*

Eco Logical Australia (2010) *Rocglen Coal Mine Extension Project Biodiversity Offset Strategy*

Eco Logical Australia (2009) *Whitehaven Regional Biodiversity Offset Strategy*

GE Holt & Associates Pty Ltd (2011) *Short and Long Term Stability of the Eastern Highwall*

GSS Environmental (2011) *Rocglen Coal Mine Extension Project Environmental Assessment*

GSS Environmental (2011) *Rehabilitation and Decommissioning Strategy*, *Rocglen Coal Mine Extension Project*

GSS Environmental (2010a) *Soil Survey and Land Resource Impact Assessment, Rocglen Coal Mine Extension Project*

GSS Environmental (2010c) *Surface Water Assessment*, *Rocglen Coal Mine Extension Project*

RCA Australia in conjunction with Soil Conservation Service (2008, revised 2009) *Site Water Management Plan*

RPS (2011) *Rocglen Coal Mine Extension Project – Submission from Heritage Branch*

RPS (2010a) *Flora and Fauna Assessment for the Proposed Rocglen Coal Mine Extension Project*

RPS (2010b) *Cultural Heritage Survey and Assessment*, Rocglen Coal Mine Extension Project.

Spectrum Acoustics (2010) *Noise and Vibration Impact Assessment*, Rocglen Coal Mine Extension Project

R.W. Corkey & Co. (2008) *Mining Operations Plan*

APPENDIX A

ECO LOGICAL AUSTRALIA PTY LTD
ABN 87 096 512 088
www.ecoaus.com.au

1st June 2011

Mr Danny Young
Group Environment Manager
Whitehaven Coal Mining Ltd
PO Box 600
GUNNEDAH NSW 2380

Dear Mr Young

RE: RESPONE TO SEWPAC and OEH SUBMISSIONS - ROCGLEN COAL MINE EXTENSION PROJECT – BIODIVERSITY OFFSET STRATEGY

Please find following our responses to the issues raised by the Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) review dated 15th April 2011 and the NSW Office of Environment & Heritage (OEH), letter dated 11th April 2011 regarding the above.

Department of Sustainability, Environment, Water, Population and Communities

The general nature of the SEWPAC review is a desire to have all the issues relating to the EPBC Act clearly identified and not incorporated into NSW requirements.

The following response provides this additional clarification to the issues raised in the SEWPAC review and should be read in conjunction with the more detailed information in the Rocglen Coal Mine Extension – Biodiversity Offset Strategy (ELA November 2010) and the Flora and Fauna Assessment report (RPS HSO 2010). For simplicity, the information relating to EPBC Act maters has been extracted from this report, clarified and re produced here.

General

Figure 1 labels those EPBC Act listed ecological communities within the project area, the area (ha) and location of impacts. Tables 1 and 2 identify the impacts by area and condition of each EPBC Act listed community (total 16.94 ha) and area of suitable habitat for listed species (46.9 ha).

As stated on page 21 of the offset strategy (ELA 2010), all of the remnant woodland (not derived grasslands) vegetation to be impacted (as shown in Figure 1) is potential foraging habitat for the EPBC Act listed Swift Parrot and Regent Honeyeater, a total of 46.9 ha. Please note that page 21 of the offset strategy (ELA 2010) states that the area of foraging habitat is 47.04 ha. This has been updated to remove the 0.14 ha of Brigalow which is not foraging habitat.

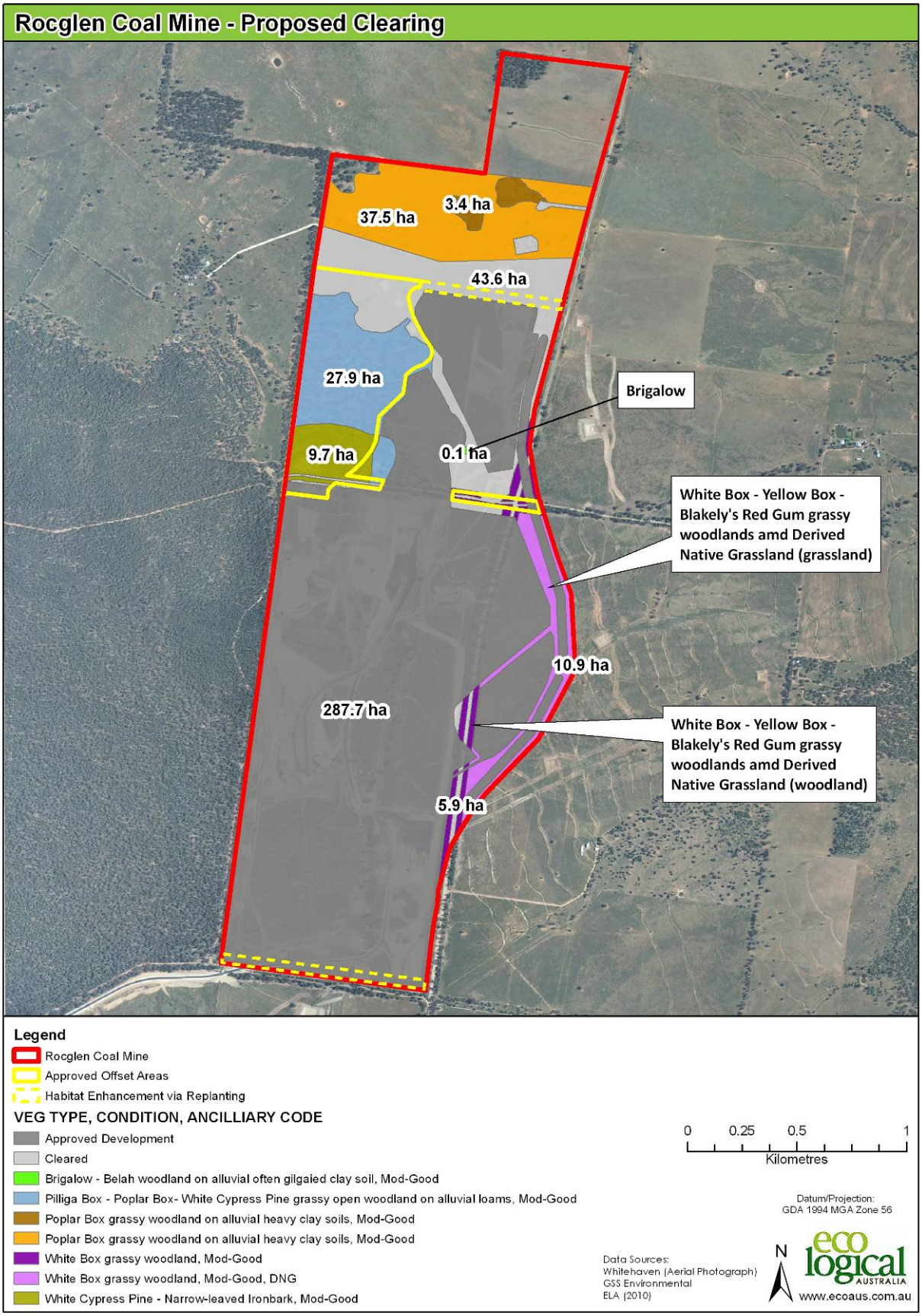


Figure 1: Vegetation of project site showing location and area of EPBC Act listed ecological communities to be impacted

Table 1: EPBC Act listed ecological community impact areas and proposed offset areas

EPBC Act listed ecological community	Condition	Mine Extension Impacts (ha)	Credits Required	Credits to be retired	Credits generated per ha	Area of Offset (ha)	Offset: Impact Ratio
Brigalow #	Woodland	0.14	6	6	9.70	0.62	4.42
White-Box, Yellow Box, Blakely's Red Gum grassy woodland and Derived Native Grassland grassy woodland	Woodland	5.9	369	331	9.70	34.12	5.78
White-Box, Yellow Box, Blakely's Red Gum grassy woodland and Derived Native Grassland grassy woodland	Derived Native Grassland	10.9	407	1,065	9.00	118.33	10.86
Total Offset Proposed		**16.94**	**782**	**1,402**		**153.08**	**9.04**

Brigalow to be offset with White Box woodland

Table 2: Area of impacted habitat for EPBC Act listed species (Regent Honeyeater and Swift Parrot) and proposed offset areas

Potential foraging habitat	Condition	Mine Extension Impact Area (ha)	Credits to be retired	Credits generated per ha	Area of Offset (ha)	Offset: Impact Ratio
Pilliga Box - Poplar Box-White Cypress Pine grassy open woodland on alluvial loams	Woodland	27.9				
Poplar Box grassy woodland on alluvial heavy clay	Woodland	3.4				
White-Box, Yellow Box, Blakely's Red Gum grassy woodland and Derived Native Grassland grassy woodland	Woodland	5.9	331	9.70	34.12	
White Box - White Cypress Pine Shrubby open forest	Woodland		1,073	7.50	143.07	
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open	Woodland	9.7	564	10.40	54.23	
Total		**46.9**	**1,968**		**231.42**	**4.93**
Future potential foraging habitat (canopy regeneration)						
White-Box, Yellow Box, Blakely's Red Gum grassy woodland and Derived Native Grassland grassy woodland	Derived Native Grassland to be restored		1,065	9.00	118.33	2.52
Total future potential habitat					**349.75**	**7.46**

Offsets

The quantum (area) of offset required for the impacts of the proposed Rocglen mine extension have been calculated using the NSW Biobanking Assessment Methodology. This methodology calculates the number of "credits" required at the impact site based on the area and condition of each vegetation type impacted and the number of credits generated at a Biobank site based on the improvement in biodiversity values via conservation management. The results are expressed as a number of credits.

For the purpose of EPBC Act considerations, the number of credits can be converted to area (ha) equivalents based on the number of credits required/generated per hectare.

Table 1 provide a summary of the hectare quantities and condition of proposed offsets including the conversion of credits to hectares i.e. 34.12 hectares of White-Box, Yellow-Box, Blakely's Red Gum grassy woodland to offset impacts to 5.9 ha of White-Box, Yellow-Box, Blakely's Red Gum grassy woodland remnants in 6 small patches in the road margins of Wean Road (an offset to impact ratio of 5.78:1) and 118.33 ha of White-Box, Yellow-Box, Blakely's Red Gum derived native grassland to offset impacts to 10.9 ha of White-Box, Yellow-Box, Blakely's Red Gum derived native grassland (an offset ratio of 10.86:1).

It is noted that the 10.9 ha of derived native grassland is in a paddock that has been cultivated and grazed for many decades as shown by the aerial photographs in the offset strategy (ELA 2010) but still retains a predominantly native understory (53% ground cover) and there are 12 or more native understory species other than grasses thus meeting the EPBC Act listed ecological community (see Appendix 1 of the Biodiversity Offset Strategy). It is noted that exotic pasture grasses consisted 47% of the ground cover. The condition of the derived native grassland in the offset site is in an equivalent condition.

The 0.14 ha of impacts to the Brigalow listed ecological community, which was not determined a controlled action by SEWPAC, will be offset with 0.62 ha of White-Box, Yellow Box, Blakely's Red Gum grassy woodland which is considered a "like for like' offset in terms of impacts to one EEC being offset with another EEC.

Table 2 provides a summary of the impacts to potential foraging habitat for the Swift Parrot and Regent Honeyeater (46.9 ha) and the area of suitable woodland foraging habitat to be set aside in the regional offset area (231.42 ha), which is an offset to impact ratio of 4.93:1. When combined with the area of derived native grassland that will be restored to woodland (118.33 ha), this increases the future potential foraging habitat for these species, permanently protected and managed to 349.75 ha or an offset ratio of 7.46:1.

The proposed offset site is 100% owned by Whitehaven Coal Ltd, will be permanently protected on title by a Biobanking Agreement entered into with the NSW Minister for the Environment under the NSW Threatened Species Conservation Act and will be managed in perpetuity in accordance with a Biobank Site Management Plan approved by the Minister with management funds (calculated for in perpetuity management) held in Trust (see Section 5 of the Biodiversity Offset Strategy).

A Biobanking Agreement is the highest level of protection that a conservation area can receive in NSW other than dedication under the National Parks and Wildlife Act. Only the Minister for the Environment can approve any detrimental activities within a Biobank site and these must be offset.

Figures 2 shows the regional location of the proposed offset site, proximity to mine site (Figure 3) and the location/distribution of the EPBC Act listed ecological community in the proposed offset sit (Figure 4). Table 3a and 3b provide further details of the areas of each vegetation type to be protected in the Biobank site, including vegetation types that are not listed ecological communities under the EPBC Act.

The management plan provides for the management of access, weeds and feral animals across the entire Biobank site, the enhancement of woodland areas and restoration of derived grassland areas by permanent exclusion of grazing and targeted tree, mid storey and ground cover planting.

Agreement has been reached with the NSW National Parks and Wildlife Service (part of the Office of Environment and Heritage) to transfer the land at the end of year 10 and for the site to be dedicated as an addition to the Kelvin Aboriginal Area.

Table 3a: Area and number of credits available by vegetation type in the Whitehaven Coal Regional Biodiversity Offset Area

EPBC Act listed community shown in yellow.

VEGETATION TYPE	AREA (HA)	CREDITS GENRATED	CREDITS GENERATED /HA	CREDITS REMAINING	AREA REMAINING (HA)
Semi-evergreen vine thicket of basalt hills of the NSW north western slopes	176.2	1,977	11.2	1,820	162.5
White Box - White Cypress Pine shrubby open forest of the Nandewar and Brigalow Belt South Bioregions	486.8	3,627	7.5	2,822	376.3
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	350.6	3,216	10.4	1,402	134.8
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	474.1	4,934	9.2	2,415	262.5
Total	**1487.7**	**13,754**	**9.25**	**8,459**	**936.1 ha**

Table 3b: Area of each condition class of Grassy White Box and number of credits available by vegetation type in Whitehaven Coal Regional Biodiversity Offset Area

VEGETATION TYPE	AREA (HA)	CREDITS GENRATED	CREDITS GENERATED /HA	Proportion of Area (%)
White-Box, Yellow Box, Blakely's Red Gum grassy woodland and Derived Native Grassland grassy woodland	79.0#	766	9.7	22.5
White-Box, Yellow Box, Blakely's Red Gum grassy woodland and Derived Native Grassland grassy woodland	271.6	2450	9.0	77.5
Total	**350.6**	**3216**		**100%**

#The area to be registered as a Biobank site includes 7.6 ha of road reserves on the western boundary owned by Whitehaven Coal which is predominantly White-Box, Yellow Box, Blakely's Red gum grassy woodland which is not shown in Figure 4 and not included in the area total in Table 3b.

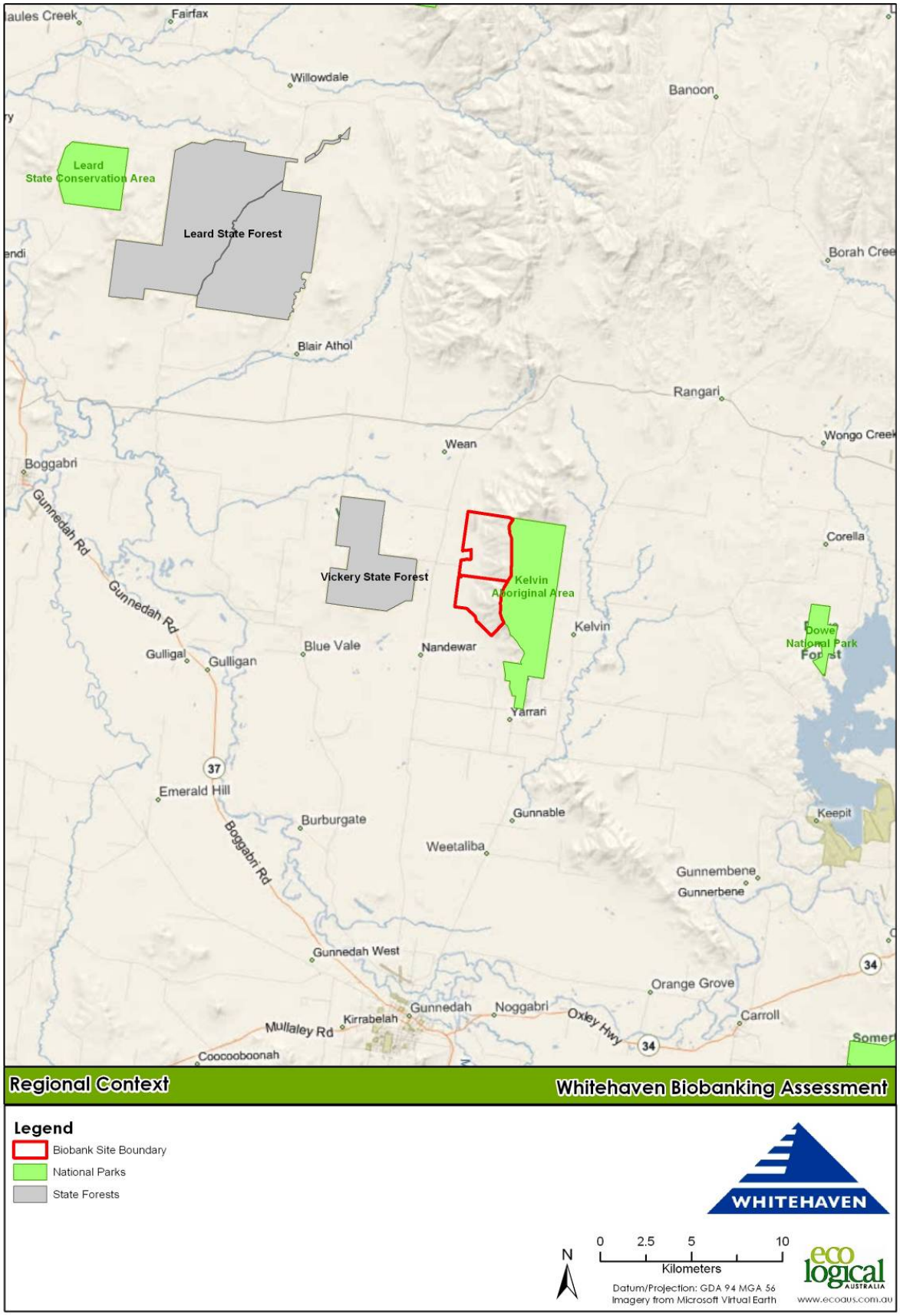


Figure 2: Regional location of Whitehaven Coal Regional Biodiversity Offset Site

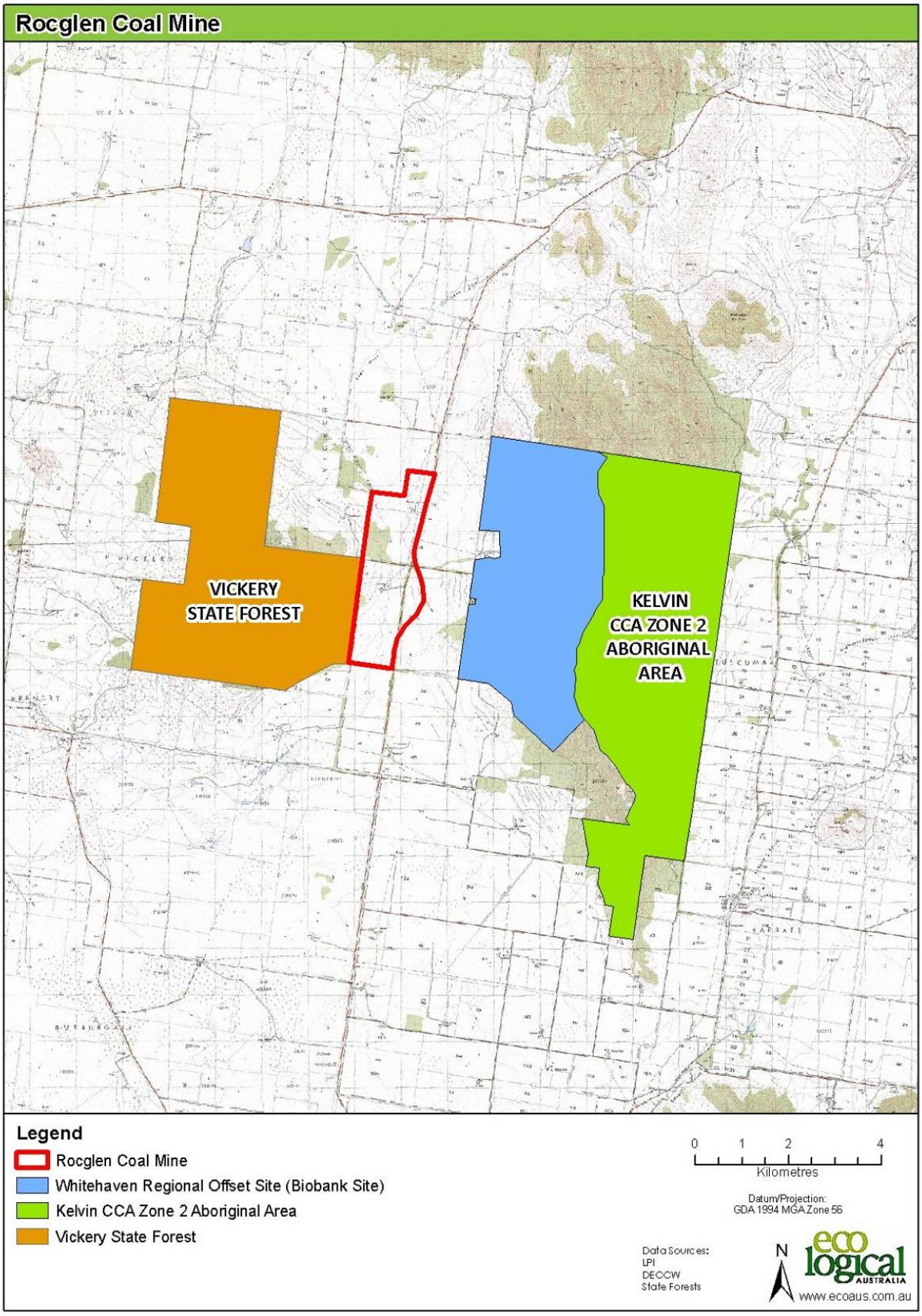


Figure 3: Proximity of Whitehaven Coal Regional Biodiversity Offset Site to project site

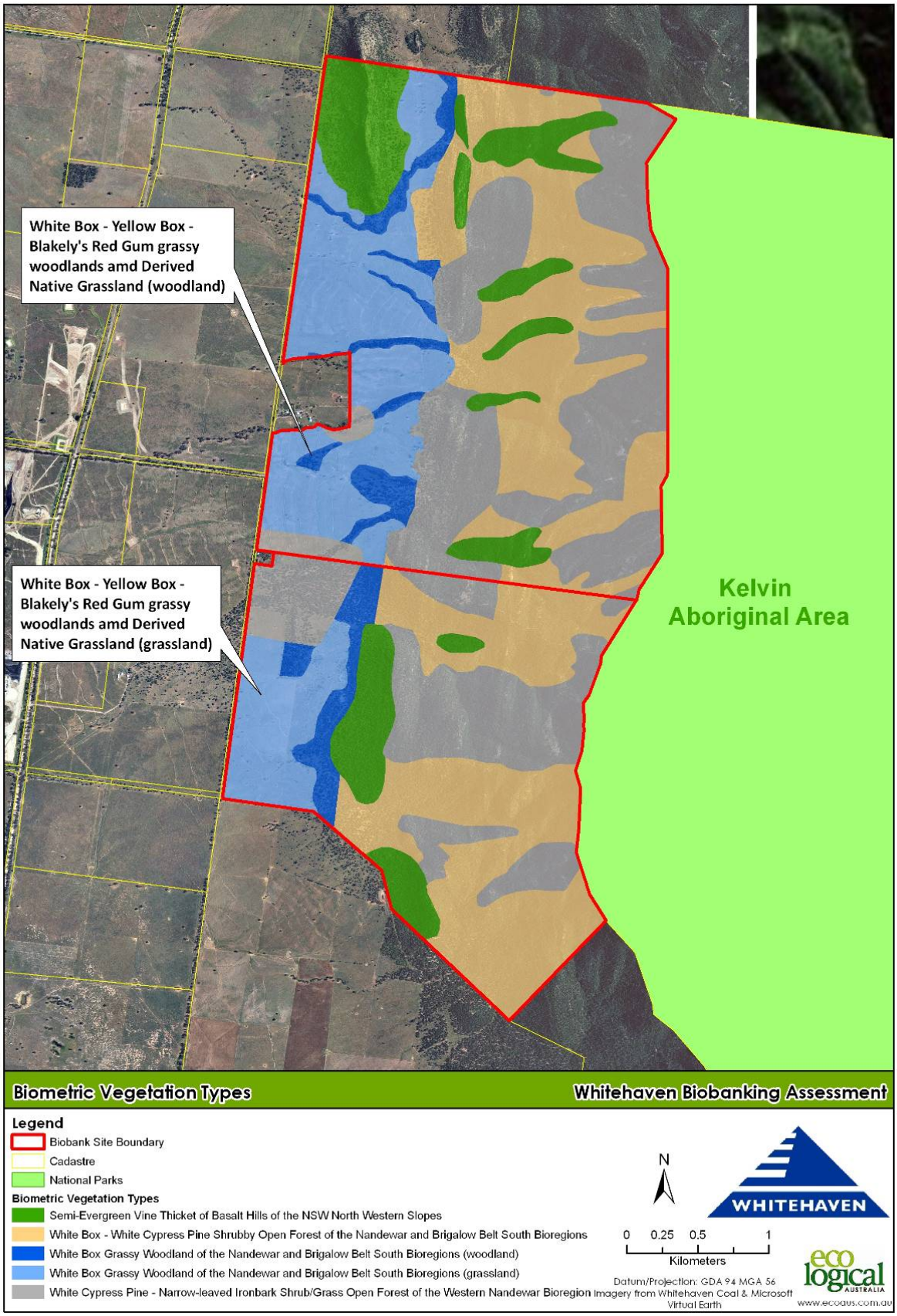


Figure 4: Vegetation map of Regional Biodiversity Offset Site showing location of EPBC Act listed ecological communities being used as an offset for the Rocglen mine extension

Draft Commonwealth Offset principles

The offset package proposed is consistent with the draft Commonwealth offset principles in that:-

- the offset package is a direct package (Principle 4) that is targeted to the EPBC Act matters that are being impacted and determined to be a controlled action (Principle 1), are on a like for like basis (Principle 5):
    - 1,402 White Box – Yellow Box –Blakely's Red Gum grassy woodland and derived native grassland biodiversity credits are being retired to offset impacts to 5.9 ha of intact White Box woodland along Wean Road and Jaeger Lane and 10.9 ha of derived native grassland within the mine site boundary). Of these credits, 337 credits (equivalent to 34.74 ha) are woodland credits and 1,065 (equivalent to 118.33 ha) are derived grassland credits. An offset to impact ratio of 5.78:1 and 10.86:1 respectively.
    - 231.42 ha of suitable foraging habitat for the Regent Honeyeater and Swift Parrot will be protected to replace the loss of 46.9 ha of suitable foraging habitat (intact woodland remnants) as a result of the mine extension a ratio of 4.93:1. When combined with 118.33 ha of derived grassland to be restored to woodland this totals 349.75 ha of potential future foraging habitat (an offset ratio of 7.46:1).
- The Whitehaven Regional Biobank Site will have the highest level of conservation status outside of National Parks (via a registered Biobanking Agreement on title that is currently being finalised by the Office of Environment and Heritage) (Principles 3 and 7);
- The Whitehaven Regional Biobank Site is to be actively managed via a BioBanking management plan with in-perpetuity management costs held in Trust (Principles 3 and 7);
- The offset area is less than 1 km to the east of the mine site and is therefore in the same general area as the development activity (Principle 6);
- The offset is enforceable and will be monitored and audited in accordance with the Biobank Agreement (Principle 8); and
- The Whitehaven Regional Biobank Site enhances and provides strategic conservation outcomes to the west of the Kelvin CCA Zone 2 Aboriginal Area and provides protection to vegetation types not well represented in the existing reserve system (White Box Grassy Woodland). The Whitehaven Regional Offset Site also enhances north-south connectivity on a regional scale and will eventually form part of an east-west link with Vickery State Forest once the Rocglen Coal Mine is rehabilitated (Principle 2).

Office of Environment and Heritage
Issue 4 Offset Proposal

Clarification regarding 60ha of original offset

The proposed offset strategy (retirement of 4, 859 biodiversity credits from the Whitehaven Regional offset site) is **in addition to** the existing condition of approval to set aside 60 ha in the Regional Offset site. The location and vegetation types of this 60 ha has previously been agreed to with the former DECCW and is equivalent to 589 credits (271 White Box – White Cypress Pine shrubby open forest and 318 White Cypress Pine – Narrow-leaved Ironbark open forest credits respectively).

The proposal has not provided a "maintain or improve" outcome

Following discussions with officers from the OE&H on 25th May 2011, it was agreed that the offset strategy proposed does not meet an improve or maintain outcome as defined by OE&H due to the matching of some vegetation types. However, OE&H indicated that the offset strategy proposed was consistent with previous discussions and agreements (i.e. use of the regional offset site), provided for in perpetuity protection and funded management of a single consolidated offset area and contributed to regional conservation priorities by securing a significant area of land adjacent to an existing NPW Act reserve which enhances a north-south link to the Mount Kaputar range.

On this basis, the offset strategy proposed is consistent with the NSW Offset principles, particularly principles 6 and 10. Key components of the offset package include:

- The vegetation at the Whitehaven Regional Biobank Site is generally of equal or greater conservation status to the project site other than the partial use of Semi-evergreen vine thicket to partially offset impacts to Piliga Box and Poplar box; and White-Box Cypress Pine shrubby open forest to offset remaining impacts to Piliga Box (**Principle 10** Offsets must be targeted on a like for like or better conservation outcome).

- The proposed offset area (approximately 525 ha based on an average of 9.25 credits generated per hectare in the Biobank site), is 4.75 times the size of the cumulative area to be impacted (110.44 ha) at the project site (proposed mine extension impacts of 95.44 ha and replacement offset for impacts to 47.9 ha of the 111.3 ha of the original offsets provided for the original mine approval, the equivalent of 15 ha of impact) (**Principle 6** offsets should aim to result in a net improvement in biodiversity over time and **Principle 9** Offsets must be quantifiable). These quantum's have been calculated using a biometric tool that considers the structure, function and compositional elements of biodiversity (**Principle 5**);

- The Whitehaven Regional Biobank Site will have the highest level of conservation status outside of National Parks (via a registered Biobanking Agreement on title that is currently being assessed by DECCW) (**Principle 7** Offsets must be enduring);

- The Whitehaven Regional Biobank Site is to be actively managed via a BioBanking management plan with in-perpetuity management costs held in Trust; (**Principle 7** Offsets must be enduring)

- The Whitehaven Regional Biobank Site enhances and provides strategic conservation outcomes to the west of the Kelvin CCA Zone 2 Aboriginal Area and provides protection to vegetation types not well represented in the existing reserve system (White Box Grassy Woodland). The Whitehaven Regional Offset Site also enhances north-south connectivity on a regional scale and will eventually form part of an east-west link with Vickery State Forest once the Rocglen Coal Mine is rehabilitated (**Principle 11** Offset must be located appropriately).

Further, consistent with **Principle 8** (offset must be agreed to prior to the impact occurring), the offset package has been fully described and has been proposed as part of the Environment Assessment and will be enforceable through development consent conditions (**Principle 13**). The proposed offset area is supplementary (**Principle 12)** and has not been used to offset other impacts or received any funding.

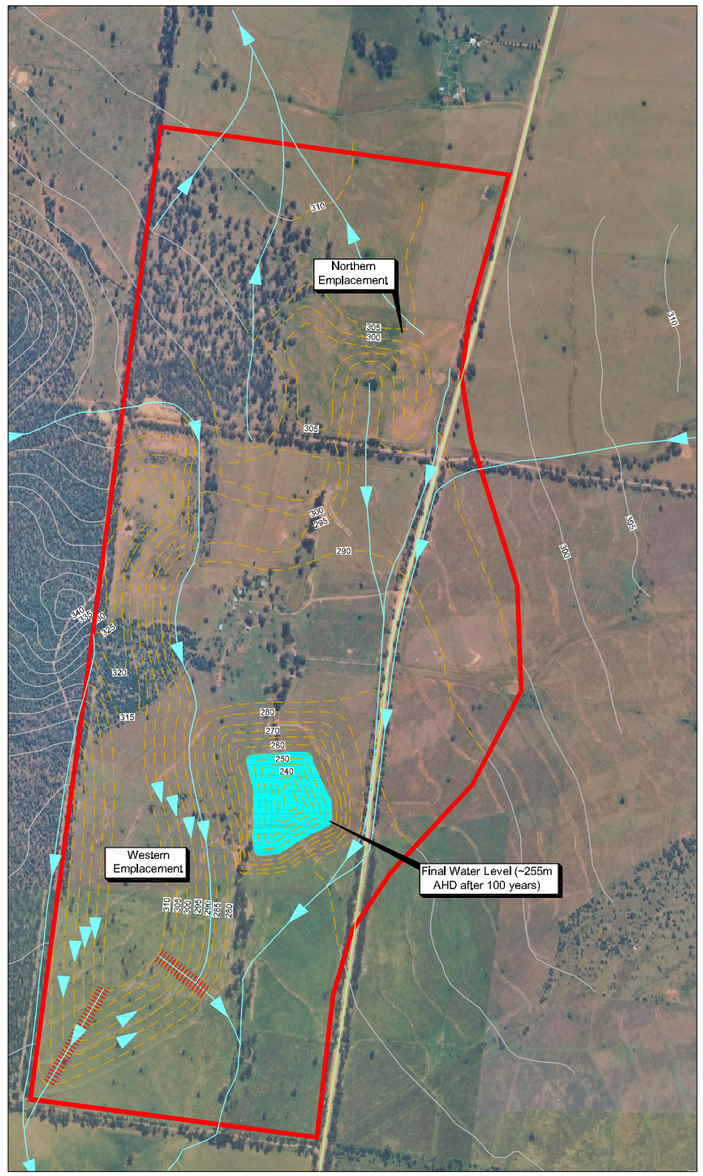
Yours sincerely

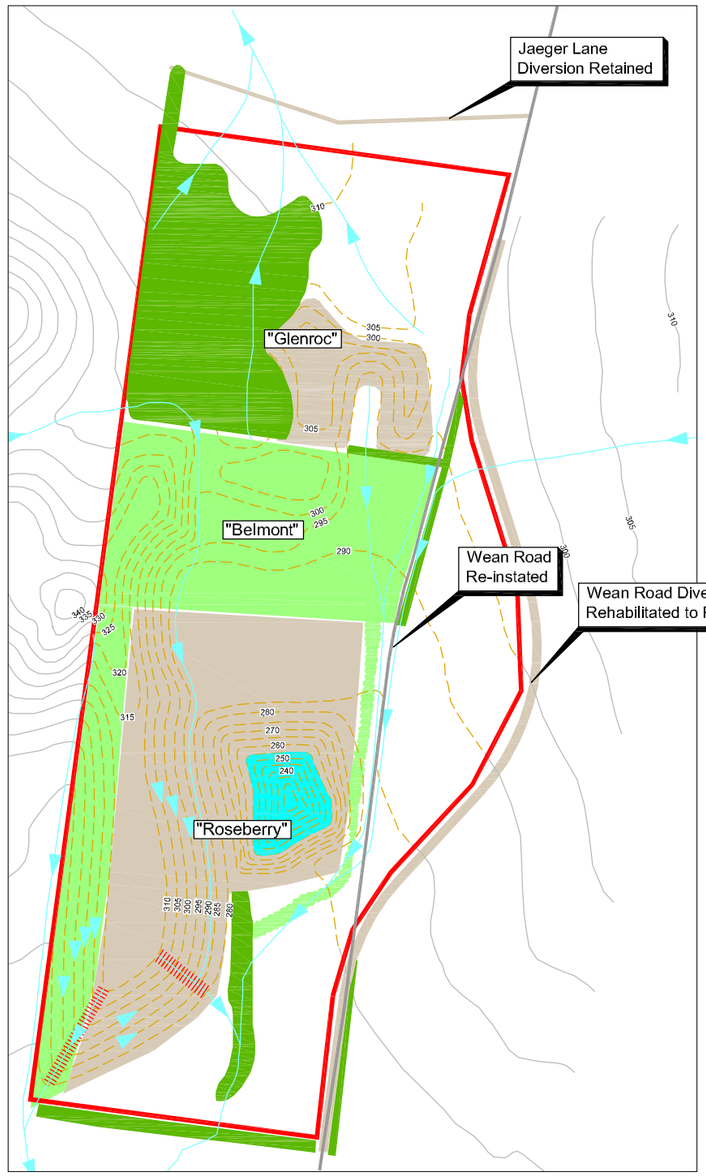
Robert Humphries
Manager Offset Programs
Eco Logical Australia

APPENDIX B

\\SERVER\RWC\584\58401\CAD\584Base_2.14 Final Landform.DWG

TN
MN





REFERENCE
- Project Site Boundary
- Reconstructed Landform Contour (5m Interval)(photo)
- Reconstructed Landform Contour (5m Interval)(topo)
- Final Drainage Line / Direction of Flow
- Water Storage
- Retained Vegetation
- Rehabilitated Woodland
- Rehabiltated Pasture
- Rock Flume

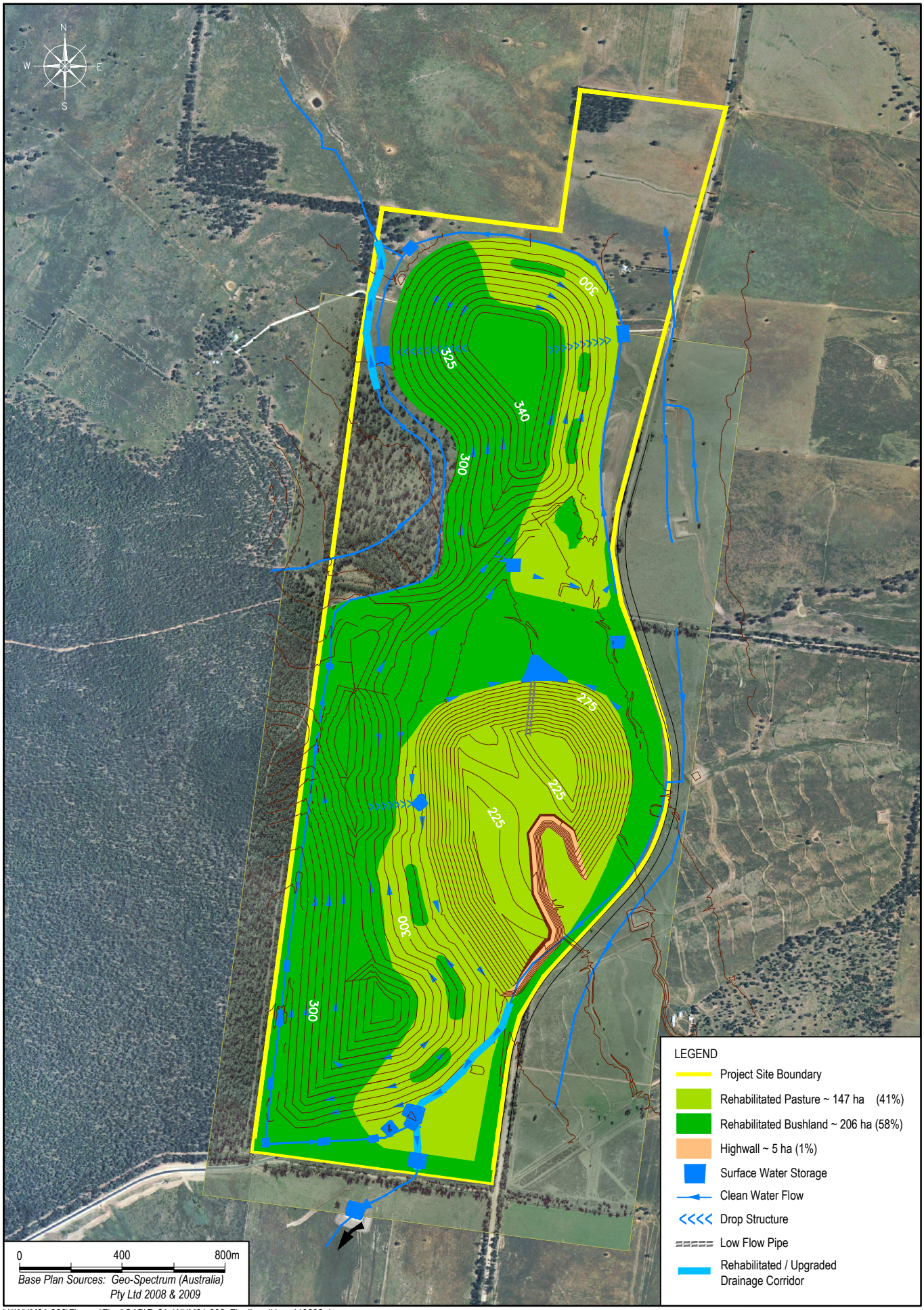
SCALE 1:20 000

200 0 200 400 600 800 1000 m

Base Photo Source: Geo-spectrum (Australia) Pty Ltd - Date of Photograph: 22 November 2001

Figure 2.14
FINAL LANDFORM AND REVEGETATION

APPENDIX C



V:\WHM01-008\Figures\Final\CAD\Fg21_WHM01-008_FinalLandUse_110602.dwg
To be printed A4

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Rocglen Coal Mine Extension Project
Post-Mining Landform and Land Use

FIGURE 21

APPENDIX D

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
15 Callistemon Close
Warabrook NSW 2304
PO Box 324
Hunter Region MC NSW 2310
Phone (02) 4960 9600
Fax (02) 4960 9601

Whitehaven Coal Limited
C/- GSS Environmental
PO Box 907
Hamilton NSW 2303

Project 49532.01
25 May 2011
PWW:cd
P:\49532.01\Docs\49532.01-01.doc

Attention: Ms Eryn Bath

Dear Sirs

Response to NSW Office of Water Comments
Rocglen Coal Mine Extension Project

1. Introduction

This letter provides comments with regard to the NSW Office of Water (NOW) letter of 5 May 2011 regarding the Whitehaven Rocglen mine expansion project application. The work was carried out for Whitehaven Coal.

2. Comments from the NSW Office of Water

NOW notes that 'the Rocglen Coal Project possesses a licence under Part 5 of the Water Act 1912, which they are required to maintain to ensure groundwater abstracted during mining operations is appropriately accounted for and authorised'. They indicate that 'this license however does not authorise any abstraction or displacement of groundwater from an alluvial groundwater source which is administered under the Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003 (WSPULNGWS)'.

NOW also indicates that 'NGWS covers the alluvium immediately to the south and east of the Rocglen expansion application area. The proponent must not intercept or displace any water from the WSPULNGWS without obtaining shares and an access licence to cover any water loss from this system and manage their impacts according to rules contained within the WSPULNGWS.'

NOW does not object to the approval, subject to the provision of 'rigorous verification and accounting processes being imposed as conditions'.

NOW requires that the verification process include mapping of alluvial boundary to the Upper Namoi alluvium including a clearly defined setback distance from the edge of the mapped alluvium.

NOW also indicated the need for further examination of long term impacts to the local groundwater resulting from the project and additional groundwater predictive assessment work as follows:

- Liaison with NOW regarding improved monitoring and additional modelling to interference drawdown in the alluvial groundwater source;

- Further calibrated modelling with regard to operational and post mining drawdown;
- Develop a Groundwater Management Plan (GWMP) to include the following:
  - Additional groundwater modelling and verification process to predictions made in EA;
  - Present and justify trigger levels for response action, which must include maintaining satisfactory water supplies for surrounding landholders;
  - Present notifications once trigger levels are exceeded and develop contingency responses to trigger levels in consultation with NOW;
  - Review and expand the current groundwater monitoring and reporting programmes to include baseline water quality data, to identify adverse impacts and to quantify impacts to surrounding landholder water supply.
- Provide an annual report of alluvial and hard rock aquifers:
  - Provided to NOW each year;
  - Interpreted drawdown levels from mining;
  - Trend analyses of groundwater levels against rainfall and mining operations for '*pre and post subsidence'* – presumed to refer to pre and post mining;
  - Account for any drawdown loss of alluvial groundwater or river flows; and
  - Assessment of depressurisation of coal measures.

3. Existing Licence Conditions

It is noted that the existing groundwater interference licences include the following conditions:

- Prepare and implement a groundwater monitoring program, in consultation with DECCW, NOW and DOP to include:
  - Further Detailed development of the regional and local groundwater model;
  - Detailed baseline data to benchmark the natural variation in groundwater level, yield and quality;
  - Groundwater Impact Assessment Criteria;
  - Program to monitor the impact of the project on groundwater level, yield and quality; and
  - Procedures for reporting the results of the monitoring.
- Prepare groundwater management plan;
- Prepare groundwater contingency plan including trigger levels;
- Undertake remedial action if available drawdown attributable to mining is reduced by over 10%;
- Monitor the surface water level (SWL) and saturated thickness and water quality of the following registered bores:
  - GW050395, GW050166, and GW011066 on the Glenroc Property;
  - GW045621 on the Yarrawonga Property;
  - GW044068 and GW044069 on the Yarrari Property;

- GW022319 on the Roseberry Property; and
- GW013369 on the Brolga Property.

4. Site Water Management Plan

There is an existing Site Water Management Plan, developed by RCA in conjunction with the former Soil Conservation Service (NSW Department of Lands). The plan addresses issues in the licence conditions and includes the following:

- Groundwater Monitoring Programme which includes the following elements:
  - Further development of the regional and local groundwater model;
  - Detailed baseline data to benchmark the natural variation in groundwater levels, yield and quality (including at any privately owned bores in the vicinity of the site);
  - Groundwater impact assessment criteria;
  - A program to monitor the impact of the project on groundwater levels, yield and quality; and
  - Procedures for reporting the results of this monitoring.

  The GWMP also comprises Groundwater Contingency measures

5. Previous DP recommendations

Updated groundwater modelling and prediction of impacts to groundwater from the proposed mine expansion were undertaken by Douglas Partners (DP), as presented in its report, 49532.01 December 2010. The assessment was made on the basis of existing site monitoring data.

The report indicated that there is some uncertainty in the site conditions, in particular to the south west of the site, and pit inflows greater than 700 ML/yr may be possible if adverse conditions occur. The modelling also includes that a proportion of pit inflows may will come from the NGWS (Namoi Alluvium). Therefore a robust ongoing monitoring program and updating of the predictive model were recommended as mining continues, to clarify the potential impacts on the NGWS..

The report made the following recommendations with regard to improving groundwater monitoring at the site:

- The aquifer interval monitored by each of the bores is not known with certainty. Bores should be cleaned out (air-lift developed) and depth checked with a weighted tape. Bores should then be geophysically wireline logged (SP/SPR and Gamma) to confirm slotted intervals and the nature of the strata over slotted intervals;
- All monitoring bores should be surveyed for location and level (both ground level and the level of the Reference Point (RP) from which groundwater levels are measured);
- Monitoring of groundwater levels should initially be undertaken on a monthly basis for the first year of the expansion, after which the monitoring interval could potentially be relaxed subject to

review of the results. In the longer term a monitoring interval of three months is anticipated. The monitoring should be undertaken in the first week of the nominated month. The frequency of groundwater sampling and laboratory analysis of water samples should remain as is. Water samples should be analysed for all major ions, including carbonate; and

- Pressure transducers/dataloggers should be installed in monitoring bores MP-01 to MP-05 for the continual recording of groundwater levels. These instruments should be downloaded every two months. In the case of MP-04 and MP-05, these wells only just intersected the water table when installed and have been observed to run dry. It is recommended that these bores be deepened to at least 10 m below the water table.

The following program of investigations was recommended to clarify uncertainty with regard to the proximity of alluvium to the south the site:

- Bore MP-4 is nominally located within the alluvium south of the mine. Once this is confirmed through the activity recommended above, a second bore should be drilled adjacent to it, to a depth at which the base of the alluvium is intersected. This adjacent bore should be completed as a monitoring bore in the Maules Creek Formation and have a pressure transducer/datalogger installed for continuous water level monitoring;
- Bore WB-01 is located within the alluvium north of the mine. Once this is confirmed through the activity recommended above, a second bore should be drilled adjacent to it, to a depth at which the base of the alluvium is intersected. This adjacent bore should be completed as a monitoring bore in the Maules Creek Formation and have a pressure transducer/datalogger installed for continuous water level monitoring. Such actions will need to be agreed to by the relevant landowners; and
- There is some uncertainty regarding the nature of the interface between the southern alluvium and the weathered conglomerate profile of the Maules Creek Formation at the southern end of the proposed pit. It is recommended that a pair of piezometers be installed immediately to the south of the proposed pit, one in the Belmont Seam and one in the alluvium/weathered conglomerate. It is also recommended that hydraulic testing be undertaken on the bore in the alluvium/weathered conglomerate to allow refinement of the groundwater model in this regard.

The report indicated that regular monitoring of both MP-4 and WB-01, the new piezometers immediately to the south of the pit, and their adjacent bores will assist in assessing the degree of hydraulic connection between the Maules Creek Formation and the alluvial aquifer.

6. Comments

Review of the proposed consent conditions by NOW indicates that many of the proposed conditions are already part of the groundwater licence conditions and included in the existing water management plan. Douglas Partners has identified some deficiencies in the existing groundwater monitoring program and recommended improvements to the monitoring, and refinement of the existing groundwater model, as required, that are expected to cover most of NOWs proposed consent conditions. The improved monitoring reqime can be used to clarify potential impacts on the

NGWS (Namoi Alluvium) and determine what future groundwater abstraction licencing arrangements are required.
A meeting will be requested with NOW to discuss improvements to the proposed monitoring program as recommended by DP and will be undertaken during the preparation of a revised Site Water Management Plan to be developed in accordance with the expected Project Approval conditions. The proposed groundwater monitoring improvement measures are considered adequate at this stage.

NOW's proposed annual reporting requirements are more specific than existing reporting requirements and generally require additional interpretation of the collected data.

It is considered that updating of the groundwater model would only be required in the following instances:

- Additional investigations with regard to the proximity of the alluvium to the south of the site indicates conditions significantly different to those adopted for the modelling; and/or
- The results of groundwater monitoring show significant departures from the predictions presented to date.

Please contact either of the undersigned for clarification of the above as necessary.

Yours faithfully
Douglas Partners Pty Ltd Reviewed by

Will Wright **Iain Hair**
Principal Principal

APPENDIX E

RPS

Newcastle Office
Ground Floor, 241 Denison Street, Broadmeadow, NSW Australia 2292
PO Box 428, Hamilton, NSW Australia 2303
T +61 2 4940 4200 F +61 2 4961 6794 E newcastle@rpsgroup.com.au W rpsgroup.com.au

Our Ref: 108642
Date: 29th April 2011

Attn: Eryn Bath
GSSE
241 Denison Street
Broadmeadow, NSW 2292

Dear Eryn

RE: Rocglen Coal Mine Extension Project – Submission from Heritage Branch

This letter comes in response to correspondence provided by the Heritage Branch 16.3.2011 regarding the Environmental Assessment for the Rocglen Coal Mine Extension Project. The Heritage Branch has raised several issues that it would like to see addressed.

The following is offered as a means of allaying these concerns. Dot point one of the Heritage Branch correspondence will be addressed by GSSE separate to this letter. RPS concurs with the Heritage Branch in relation to dot point three (section 1.3.2 of RPS's Cultural Heritage and Survey Assessment) and the erroneous relic definition provided by RPS. Unfortunately, our review process did not pick up this obvious error. Section 4 of the Heritage Act 1977 offers the following definition for a relic:

"relic" means any deposit, artefact, object or material evidence that:

> *(a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and*
>
> *(b) is of State or local heritage significance.*

However, the major issue for the Heritage Branch stems from the Glenroc residence and associated outbuildings, which is outlined by them in dot points 2, 4 & 5.

The Glenroc residence and outbuildings were thoroughly investigated and assessed for potential heritage significance. Essentially the Glenroc residence is a mid 20th century weatherboard construction in what could be loosely described as 'vernacular' in style. It is neither architecturally unique, nor does it hold any heritage value. It was therefore not assessed for significance under the NSW Heritage Branch Significance Assessment Criteria. Furthermore, RPS stands by our comment that no European heritage sites were identified during the field survey. Following an inspection of the residence and outbuildings in question they were deemed to be not European cultural heritage sites. This assessment was based on the expertise of RPS Senior Archaeologist, Laraine Nelson, compiler and author of Historic Homesteads of the Muswellbrook District (Nelson & Tame) for the Muswellbrook and Upper Hunter Historical Society. This document was the base document for European heritage investigation for Upper Hunter coal expansion and is still in use.

Taken at face value, the Heritage Branch correspondence appears to indicate that any European structure encountered is a European cultural heritage site, which is clearly not the case. RPS did not conduct a significance assessment because the residence and outbuildings were not deemed to be of heritage status.

Furthermore, the standard recommendation provided by RPS for the Rocglen expansion project, which is included in the Statement of Commitments in Section 8.0 of the Environmental Assessment, is considered adequate due to that fact that the buildings in question and across the rest of the project area are not European heritage items, nor are any items of European heritage likely to exist within the project area. Consequently, a written heritage significance assessment that would guide the proposed project expansion works would be meaningless as there is nothing of heritage significance to assess.

We trust this information is sufficient for your purposes, however, should you require any further details or clarification, please do not hesitate to contact the writer by telephone.

Yours faithfully

RPS

Darrell Rigby

Archaeology Manager

BArts (Pal/Geo/Arch) GDURP