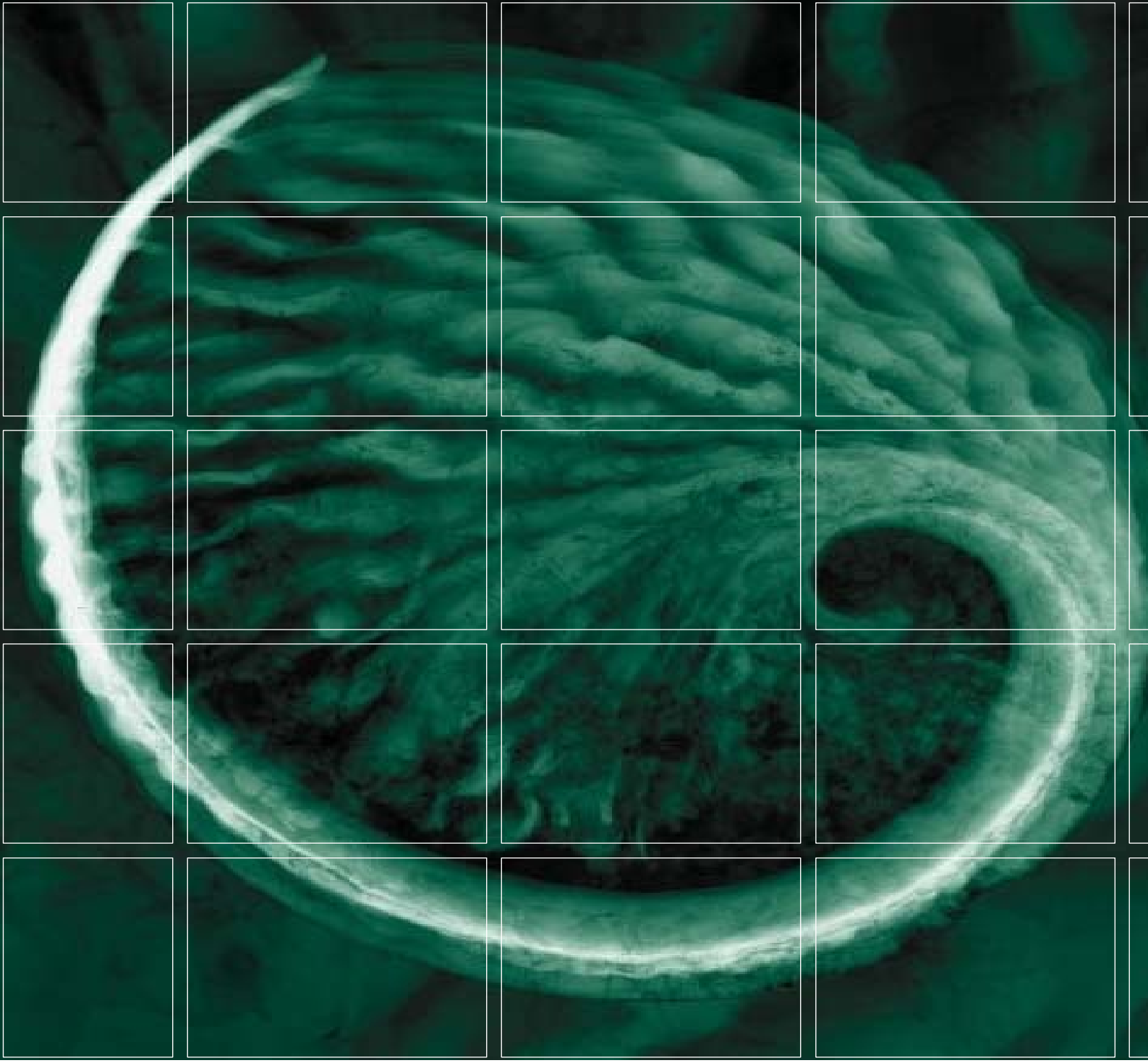

Glennies Creek Part 3A Application - Longwall Panels 10-17 Middle Liddell Seam

Project Outline and Preliminary Environmental Assessment

Glennies Creek Coal Management

August 2006

0047481.Final

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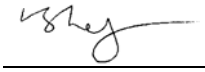
ERM

Approved by:	*Joanne Woodhouse*
Position:	Project Manager
Signed:	
Date:	*22 August, 2006*
Approved by:	*Mike Shelly*
Position:	Project Director
Signed:	
Date:	*22 August, 2006*

Environmental Resources Management Australia Pty Ltd Quality System

Glennies Creek Part 3A Application - Longwall Panels 10-17 Middle Liddell Seam

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1 INTRODUCTION

1.1 PURPOSE

In view of the recent amendments to the *Environmental Planning and Assessment Act, 1979* (EP&A Act), Environmental Resources Management Australia Pty Ltd (ERM) has been engaged by Glennies Creek Coal Management (GCCM) to prepare an application to bring the extraction of Longwall panels 10-17 of the Middle Liddell seam and associated underground development and transportation activities (the Project) under Part 3A of the EP&A Act. The application is being made, notwithstanding the continued application of s74 of the Mining Act 1992 for a further five years under the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation), so as to be consistent with the Department of Planning's current direction for the management of coal resources. This application relates to the extraction of Longwalls 10 to 17. In a meeting on 8 February 2006 between the Department of Planning and GCCM representatives, the Department confirmed that the proposal would be capable of being classified as a Major Project to which Part 3A of the EP&A Act applies. The Department of Planning also advised that a detailed description of the project should be provided with the application for project approval.

This Preliminary Assessment Report has been prepared to:

- describe the project, the project area and its compliance with relevant statutory planning considerations, and to identify key environmental issues; and

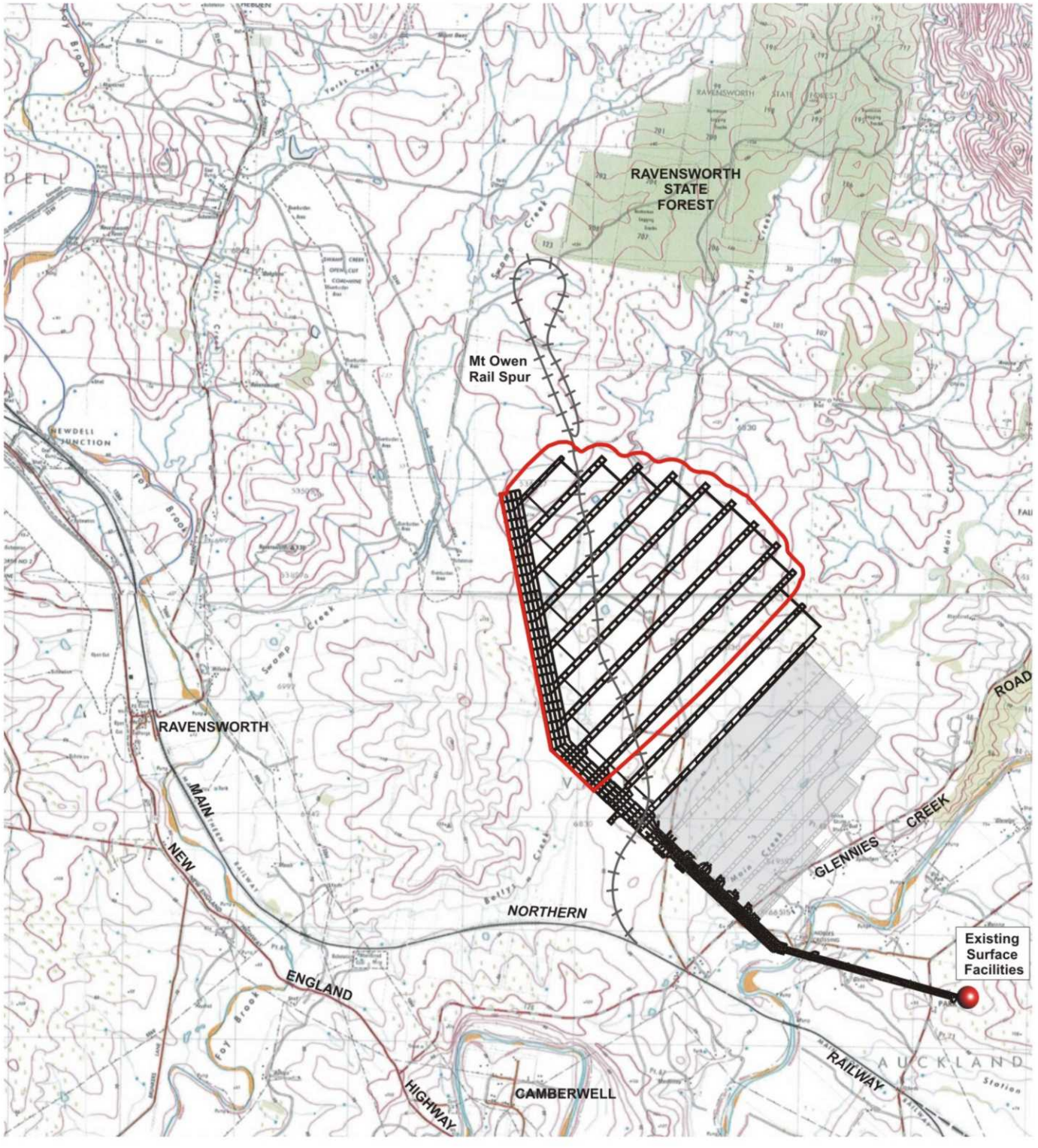
- request the Director-General's Environmental Assessment Requirements for a Project Application for the continuation of underground mining at Glennies Creek Colliery in accordance with the requirements of Section 75F of the EP&A Act.

1.2 BACKGROUND

Glennies Creek Colliery (GCC) is in the Hunter Valley Coalfield and is approximately 12 kilometres north west of Singleton. *Figure 1.1* shows the general locality of the mine including Ravensworth State Forest to the north and the small villages of Ravensworth and Camberwell to the west and south respectively.

The longwall mining area is covered by Coal Lease 382 (CL382).

The mine operates under existing development consent DA105/90 (Development Consent), which was granted by the Minister for Planning after a Commission of Inquiry on 01 November 1991 prior to the grant of CL382.



Source: LPI 1:25 000 Topographic Series, Camberwell Sheet

ERM

0 1km

Approximate Only

Figure 1.1

Locality Plan

Glennies Creek Coal Management Pty Ltd - Glennies Creek Longwall Panels 10 to 17

The consent was subsequently modified via section 96 of the EP&A Act in 1998, 2001, 2002 and 2005 to cover minor changes to surface operations and rate of extraction. CL382 was granted by the Minister for Mineral Resources on 12 November 1991. The Development Consent and CL382 provide for the construction and operation of an underground coal mine, including the extraction of coal from the Middle Liddell, Hebden and Barrett seams within the boundary of the coal lease area.

Longwall panels 1 to 6 in the Middle Liddell seam have been the subject of s138 approvals under the *Coal Mine Regulations Act, 1982* and extraction of those panels is complete. GCCM obtained Subsidence Management and s138 approvals for Longwall panels 7 to 9 in April 2006.

This application covers extraction of Longwalls 10 to 17 in the Middle Liddell seam only.

2 PROJECT OUTLINE

2.1 SITE AND LOCALITY

Glennies Creek Colliery is located in the Hunter Valley Coalfield of the Sydney Basin, approximately 12 kilometres north west of Singleton.

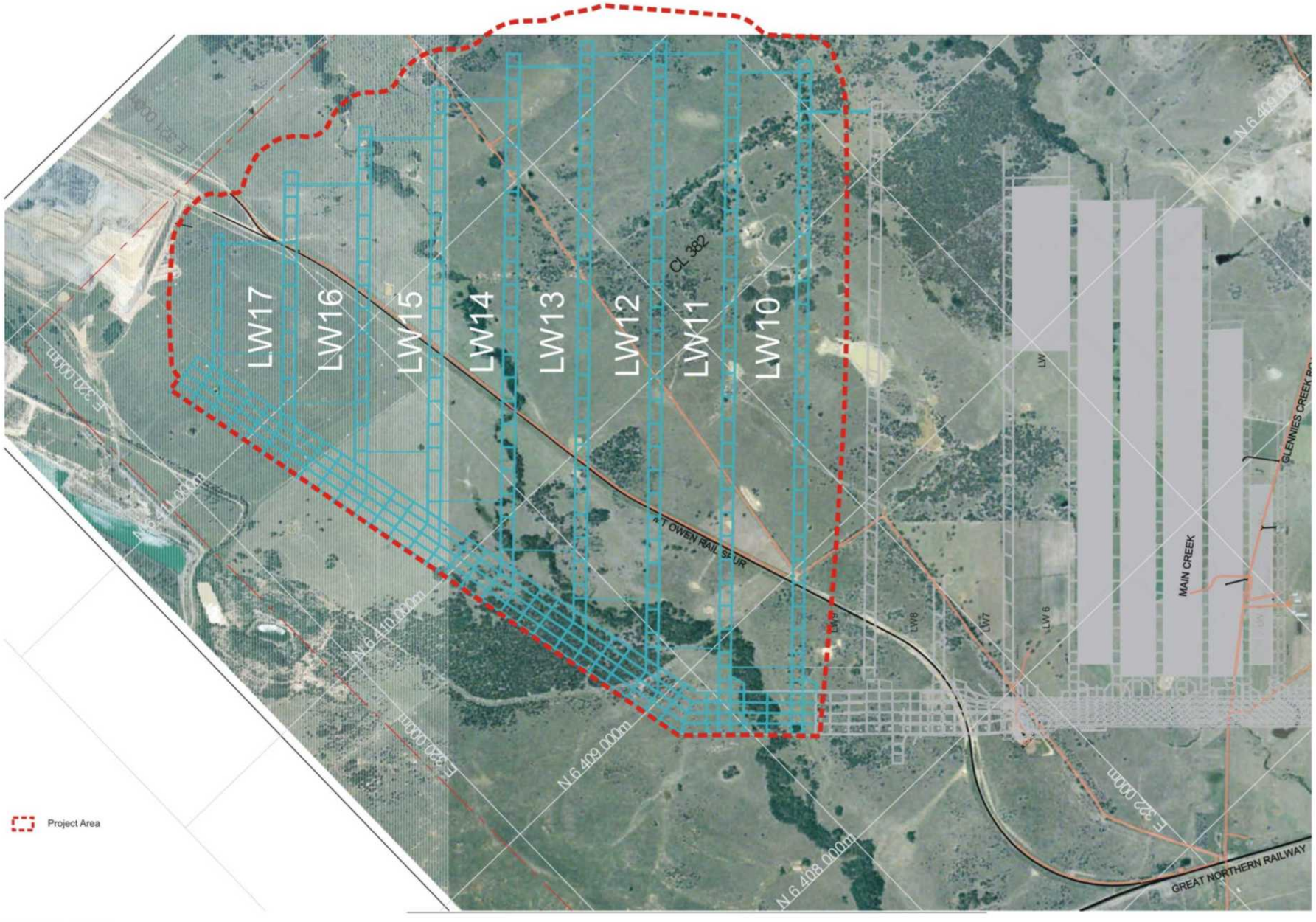
This application seeks approval for mining of the Middle Liddell seam in longwall panels 10 to 17. The project area that is the subject of the application is that area outlined in red on *Figure 2.1*. The area of existing underground workings, gateroads, access ways, conveyors, handling facilities as approved, will continue to be utilised. The total area of underground workings in the Middle Liddell seam includes approximately 600 hectares of land and includes the land parcels shown in *Table 2.1.*

The surface of the project area is dominated by grazed pasture with some remnant and regenerating areas of open forest. It is gently undulating and elevations range from 85 metres AHD to 134 AHD. The ephemeral Main Creek is located to the south east of the project area and the ephemeral Bettys Creek and associated alluvial flats traverse the northern and western portions of the project area. There are also some minor gullies and other small ephemeral drainage lines present.

The soils within the project area belong to the Bayswater and Hunter soils landscapes as described by Kovac and Lawrie (1991). The Bayswater soil landscape is formed on undulating low hills and dominates the project area. The soils are moderately alkaline to moderately acidic and are susceptible to moderate sheet and gully erosion. The alluvial Hunter soil landscape occurs in association with the floodplain along Glennies Creek and Bettys Creek. These soils are prone to erosion along watercourses and are weak to moderately alkaline.

The underlying lithology comprises the Jerrys Plains and Vane Subgroup of the Wittingham Coal Measures, within Quaternary alluvium present in association with Bettys Creek. The coal seams and surrounding strata are assigned to the Foybrook Formation, a stratigraphic unit of the Late Permian Singleton Supergroup and are preserved within the Rixs Creek Syncline. The coals are bituminous high-volatile, low sulphur and vitrinite-rich.

The main access to the site is from Middle Falbrook Road, which is connected to the New England Highway via Bridgman Road and Stony Creek Road. The privately owned Mt Owen Railway Spur traverses the site providing rail access to the adjoining Mt Owen Mine. The rail spur branches from the Main Northern Rail Line north-west of the Glennies Creek Road level crossing.



Source: Glennie Creek Coal Management

0 200m

Figure 2.1 **Existing Mine and Proposed Longwall Panels**

Glennies Creek Coal Management Pty Ltd - Glennies Creek Longwall Panels 10 to 17

Table 2.1 Real Property Description

Lot Number	Deposited Plan Number
8	6830
10	6830
11	6830
13	6830
17	6830
923	844642
5	133183
71	625171
1	725524
2	859544
3	859544
5	859544
6	859544
7	859544
8	859544
1	865784
Pt1	940619
and various roads and reserves	

Figure 2.1 is an aerial photograph of the project area and is overlain with a depiction of the mine layout, consisting of the completed mine workings, underground main roadways and gate roads, current area of extraction and the planned longwall panels. The project area is outlined in bold. The figure provides a conceptual layout of the mine plan based on current knowledge and existing operations. However, it should be noted that the final design of the longwall panels and associated gateroads will be refined as mining progresses and may vary from that shown as the conceptual plan.

The majority of the surface overlying Longwalls 10 to 17 is owned by subsidiaries of the mining company Xstrata, including Glendell Tenements Pty Ltd, Savage Minerals Ltd & Enex Foydel Ltd, Enex Ravensworth Pty Ltd and Hunter Valley Coal Corporation Pty Ltd. W.E. and A.M. Gardner own 2.2 hectares of private holding overlying Longwalls 10 to 17.

Mt Owen Mine (currently owned by Xstrata) has approval for open cut mining across approximately 200 hectares of the surface area covered by this proposal. It is anticipated that the open cut mine will result in significant changes to the existing environment including the realignment of Bettys Creek. The current understanding based on ongoing consultation between Xstrata and GCCM, is that work on the eastern rail pit is due to commence in June 2006 and is expected to be completed in June 2008. The Bettys Creek diversion is expected to be completed by the end of 2007. Based on this information provided by Xstrata, the preliminary assessment assumes the existing natural environment including vegetation and some archaeological features will no longer be intact by the time mining commences in Longwall 10.

Glendell Mine (currently owned by Xstrata) has approval for mining across approximately 22 hectares of the surface area covered by this proposal. Information on the proposed mining operations within the GCCM project area has not been supplied at this stage although consultation between Xstrata and GCCM is ongoing.

Given the layout of the Glennies Creek operation, timing of mining activities and depth of extraction ranging from 380 to 500 metres, it is anticipated that the Mt Owen open cut mining operation will not be directly impacted by this proposal, and nor would this proposal be impacted by the open cut mining operation. GCCM and Xstrata have agreed to an Interaction Management Plan which sets out an agreed management strategy for interaction between the two operations.

2.2 *OVERVIEW OF OPERATION*

The proposed mining operation at Glennies Creek Colliery is a continuation of the current longwall extraction of the Middle Liddell seam. It entails the progressive longwall mining of panels 10 to 17 once mining in panel 9 is completed. The operation will maintain the current system of extraction which utilises continuous miners for first workings and retreating longwall mining for secondary workings. Longwall extraction is the preferred method of bulk coal extraction in this location as it has a proven history of safety, high level of resource recovery and is also economically efficient. Longwall mining of the Middle Liddell seam is not expected to impact the remainder of underlying coal seams within CL382: the Hebden [and Barrett seam] is intended to be mined in the future.

Figure 2.1 shows the conceptual layout of longwall panels 10 to 17 are parallel with existing panels that are oriented in a north east/south west direction. The main headings are being developed in a north westerly direction. Each panel is approximately 250 metres wide and they range in length from 472 to 2555 metres. The chain pillars that separate each panel range from 42 to 48 metres in width, with cut throughs nominally at 100 metre centres.

The full coal seam, ranging from 2.0 to 2.4 metres in thickness and typically around 2.2 metres, will be mined. Cover depths vary from 380 metres over panel 10 to 500 metres over panels 13 and 14.

The existing approved coal handling, transport and preparation facilities at the adjoining Camberwell Coal Mine will continue to handle all coal produced from GCC underground. No modifications or changes to the existing facilities are required as the coal handling and preparation plant (CHPP) has an approved capacity of 1200 tph (nominal) or 8.7 mtpa. The approved capacity is more than adequate to process the combined production from the Glennies Creek and Camberwell operations. Routine truck haulage of underground coal from the Glennies Creek mine to the Camberwell Coal Mine preparation facilities at a rate of up to 4 mtpa is approved until 2010, at

which time routine truck haulage will be replaced by an overland conveyor. Accordingly, no surface or subsurface coal handling facilities are included in this application.

Development of the Project will necessitate the installation of up to four gas drainage boreholes per longwall panel. Gas drainage is required to maintain gas within the workings at a level that is safe for the workforce and does not adversely impact on operations.

The mine will provide continued full time employment for approximately 200 people.

2.3 SCHEDULE

Based on the current rate of mining, it is anticipated that extraction in panel 10 will commence in May 2008 and extraction in panel 17 will be completed in June 2012. However, mine scheduling can be influenced by a number of variables. As these dates are indicative only, achievement of the nominated milestones may occur before or extend beyond this period.

3 STATUTORY CONTEXT

3.1 INTRODUCTION

There are a number of statutory planning provisions that relate to the project area, including:

- *Environmental Planning and Assessment Act, 1979*;
- *Mining Act, 1992;*
- *Coal Mines Regulation Act, 1982;*
- Environmental Planning and Assessment Regulation, 2000;
- State Environmental Planning Policy (Major Projects) 2005;
- State Environmental Planning Policy No. 11 – Traffic Generating Developments;
- State Environmental Planning Policy No. 33 – Hazardous and Offensive Development;
- Singleton Local Environmental Plan 1996;
- Hunter Regional Environmental Plan 1989;
- *Protection of the Environment Operations Act, 1997*; and
- *Environment Protection and Biodiversity Conservation Act, 1999*.

The proposal is compliant with the various statutory requirements and the relevant provisions are outlined below.

3.2 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 AND REGULATION 2000

This Preliminary Environmental Assessment has been prepared to support the Major Projects Application to be submitted to the Minister for Planning to confirm that Part 3A of the EP&A Act applies to this project, notwithstanding the continued operation of s74 of the *Mining Act, 1992* to Glennies Creeks operations, by virtue of clause 8k of the EP&A Regulation. This report identifies and makes a preliminary assessment of key issues that will require further assessment and demonstrates that the project is one to which Part 3A applies. The report provides details so that the Director-General can issue the Environmental Assessment Requirements that focus on relevant key issues.

3.3 *MINING ACT, 1992 AND COAL MINES REGULATION ACT, 1982*

A Subsidence Management Plan (SMP) will be submitted to the Department of Primary Industries (DPI) prior to the requisite section 138 application under the *Coal Mines Regulation Act, 1982*. The proposal involves the continuation of an existing approved mining operation covered by mining lease (CL 382) under the *Mining Act, 1992*.

3.4 *STATE ENVIRONMENTAL PLANNING POLICIES*

3.4.1 *State Environmental Planning Policy (Major Projects) 2005*

State Environmental Planning Policy (Major Projects) 2005 identifies development to which the development assessment and approval process of Part 3A of the EP&A Act applies. The Policy establishes the Minister for Planning as the approval authority for any development classified as a 'Major Project'.

Clause 6(1) of the Major Project SEPP identifies projects under Part 3A as development that, in the opinion of the Minister for Planning, is development of a kind listed in either Schedule 1, 2, 3 or 5 of the Policy. Schedule 1 includes the following:

Mining

(1) Development for the purpose of mining that:

(a) is coal or mineral sands mining

3.4.2 *State Environmental Planning Policy No 11*

State Environmental Planning Policy No. 11 – Traffic Generating Developments (SEPP 11) aims to ensure that the Roads and Traffic Authority (RTA) is made aware of applications for developments likely to generate significant traffic impacts, and to provide the RTA with an opportunity to make representations in respect of such developments.

Traffic generating developments are identified in Schedules 1 and 2 of SEPP 11. As mining is listed in Schedule 1 as a traffic generating development the application will need to be referred to the RTA for consideration.

Given the proposal is for the continuation of mining and does not involve an increase in the coal processed each year or changes to existing transport arrangements, the existing road and rail traffic generated by the mine will not increase. It is therefore not proposed to prepare a traffic impact assessment as part of the Environmental Assessment.

3.4.3 State Environmental Planning Policy No 33

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33) provides definitions for 'hazardous industry', 'hazardous storage establishments', 'offensive industry' and 'offensive storage establishment'. The definitions enable decisions to approve or refuse a development to be based on the merit of a proposal.

SEPP 33 may apply to the proposal and will be considered during the assessment process. The approval authority must consider the specifics of the proposal, the location and intensity of the proposed activity to determine whether the proposed development may be classified as 'potentially hazardous' or 'potentially offensive' as defined in the Policy.

A preliminary hazard assessment screening test will be prepared for the project, although it is not expected that detailed assessment will be required.

3.5 HUNTER REGIONAL ENVIRONMENTAL PLAN 1989

The Hunter Regional Environmental Plan 1989 (HREP 1989) provides a regional environmental planning framework for the Hunter Region's development. The HREP 1989 aims to promote balanced development in the Hunter Region, encourage orderly and economic development and bring about optimum use of land and other resources consistent with the needs and aspirations of the local community.

Part 6, Division 1 of the HREP 1989 addresses mineral resources and extractive materials. Clause 41 of the HREP 1989 identifies matters that should be considered by consent authorities when considering proposals for mining or extraction.

'41. (1) Consent authorities, in considering proposals for mining or extraction (including dredging) –

(a) should consider the conservation value of the land concerned and apply conditions which are relevant to the appropriate post-mining or extraction land use,

(b) should, in respect of extraction from river banks or channels, ensure that instability and erosion are avoided,

(c) should consult with officers of the Department of Mineral Resources, and of the Department of Agriculture, to determine appropriate post-mining or extraction land uses,

(d) should ensure the progressive rehabilitation of mined or extracted areas,

(e) should minimise the likelihood and extent of a final void and the impact of any final void, or facilitate other appropriate options for the use of any final void,

(f) should minimise any adverse effect of the proposed development on groundwater and surface water quality and flow characteristics,

(g) should consider any likely impacts on air quality and the acoustical environment,

(h) should be satisfied that an environmentally acceptable mode of transport is available, and

(i) should have regard to any relevant Total Catchment Management strategies.'

As the project will be determined under Part 3A of the EP&A Act, the requirements of HREP 1996 are not directly applicable. However, it should be noted that the proposed continuation of mining is generally consistent with the objectives of HREP 1989 and specifically meets objective (c) of the 1(a) Rural Zone.

3.6 SINGLETON LEP 1996

The site is zoned 1(a) Rural under Singleton Local Environmental Plan 1996 (LEP 1996) and the objectives for this zone are:

(a) to protect and conserve agricultural land and to encourage continuing viable and sustainable agricultural land use,

(b) to promote the protection and preservation of natural ecological systems and processes,

(c) to allow mining where environmental impacts do not exceed acceptable limits and the land is satisfactorily rehabilitated after mining,

(d) to maintain the scenic amenity and landscape quality of the area,

(e) to provide for the proper and co-ordinated use of rivers and water catchment areas,

(f) to promote provision of roads that are compatible with the nature and intensity of development and the character of the area.

Mining is permissible with consent under the 1(a) Rural Zone and accordingly the proposal is development to which Part 3A can apply.

As this project will be determined under Part 3A of the EP&A Act, the requirements of LEP 1996 are not directly applicable. However, it should be noted that the proposed continuation of mining is generally consistent with the objectives of LEP 1996 and specifically meets objective (c) of the 1(a) Rural Zone.

3.7 *PROTECTION OF THE ENVIRONMENT OPERATIONS ACT, 1997*

An environment protection licence (No. 7622) under the *Protection of the Environment Operations Act, 1997* (PoEO Act) is held for Glennies Creek Colliery which relates to "coal mining". The licence will apply to Longwall panels 10 to 17 once extraction commences.

3.8 *ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT, 1999*

The *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) requires the approval of the Commonwealth Minister for the Environment for actions that may have a significant impact on matters of national environmental significance. The EPBC Act also requires Commonwealth approval for certain actions on Commonwealth land. Matters of national environmental significance under the Act include the following:

- World Heritage Areas;
- national heritage places;
- Ramsar wetlands of international importance;
- threatened species or ecological communities listed in the EPBC Act;
- migratory species listed in the EPBC Act;
- Commonwealth marine environment; and
- nuclear actions.

There are no World Heritage Areas, national heritage places, Ramsar wetlands or Commonwealth marine areas on or near the project area. The proposal does not involve a nuclear action. Field surveys and desktop reviews of the relevant database have shown that there are no threatened ecological communities known to occur on the project area. The proposed longwall mining activities are not expected to have a significant affect upon the health and viability of any threatened or migratory species listed under the provisions of the Act. Accordingly the EPBC Act will not apply to this project.

4 KEY ENVIRONMENTAL ISSUES AND MANAGEMENT

4.1 INTRODUCTION

Given that the project is wholly confined to underground activities, with the exception of the gas drainage boreholes, the key issues for this project relate to the direct and indirect impacts from subsidence on:

- land use and surface improvements;
- ecology;
- cultural heritage; and
- hydrology.

ERM are currently co-ordinating the preparation of an SMP for Longwall panels 10 to 17 and undertaking ecological and heritage studies to assess the impact of the proposed longwall mining. Geo Terra has been commissioned to undertake a surface water and groundwater study within the project area and Strata Control Technology (SCT) has been engaged to prepare detailed subsidence predictions.

Management of all subsidence impacts for Longwalls 10 to 17 will be addressed under the relevant Subsidence Management Plan approval process by the Department of Primary Industries.

The potential environmental issues associated with the project are addressed in the following sections. Visual impacts are not discussed as no additional surface facilities will be constructed as part of the project to which this application relates.

4.2 LAND USE AND SURFACE IMPROVEMENTS

Land use above the project area is primarily grazing. The land is predominantly owned by subsidiaries of the mining company Xstrata or its affiliates as outlined in *Section 2.1*. Underground mining activities are not expected to result in any changes to existing land use. Subsidence may have some indirect impacts along Bettys Creek but is unlikely to affect the agricultural capability of the project area. As indicated within *Section 2.1*, Bettys Creek is to be realigned as a result of Mt Owen operations. Based on the advice received from Mt Owen as to the timing of these activities, this assessment assumes that the natural environment along Bettys Creek and within the Mt Owen eastern rail pit will no longer be intact by the time mining commences in Longwall 10.

The Mt Owen rail spur and associated infrastructure traverse the surface of the project area. The rail spur line is used to haul coal from the Mt Owen Mine. Supporting infrastructure includes a concrete rail bridge at Bettys Creek, a maintenance road, water pipeline and buried communication cables, all alongside the rail spur, that service the Mt Owen Mine.

Other surface improvements include Forest Road, which is an unsealed public road, private access roads, fences, steel frame shed, farm dams, a disused residence and an underground telephone line and overhead powerline that serviced the disused residence.

Subsidence has the potential to affect surface improvements and these are discussed in *Section 4.9*.

4.3 ECOLOGY

As indicated within *Section 2.1,* the natural environment along Bettys Creek and within the areas proposed for open cut mining is not expected to be intact by the time mining commences in Longwall 10 due to Mt Owen operations. The habitats present within the remaining portions of the project area will not be significantly impacted by the proposal.

4.3.1 Dominant Vegetation Types

The project area has been extensively disturbed by land clearing and grazing and most of the project area has been cleared of native vegetation. Five vegetation communities have been identified within the area including; spotted gum/grey box/ironbark woodland, bull oak woodland, riparian vegetation, grassland and regenerating vegetation. None of these communities are listed as endangered. Hunter lowland redgum forest has been identified to the north of the project area and is listed as an endangered ecological community in Schedule 2 of the *Threatened Species Conservation Act, 1995* (TSC Act). It is likely that this represents the western limit of the community's distribution in the Hunter Valley, however, it is not a high quality representation and will not be impacted by the project.

4.3.2 Habitat Features

The three broad habitat types found at the project area are open forest, casuarina woodland and pasture. Potential habitat is available for *Diuris tricolor*, *Eucalyptus glauca* (slaty redgum), *Thesium australe* (austral toadflax), *Ozothamnus tessellatus* and *Bothriochloa biloba,* all of which are threatened plants, though *B. biloba* is no longer listed as a vulnerable species under Schedule 2 of the TSC Act, despite being listed as vulnerable under the EPBC Act. None of these species have been recorded within the project area and no potential habitat will be removed as a result of the proposal. The proposal is

unlikely to impact on the lifecycle of these species such that a local extinction would occur.

During a survey in 2005, the only threatened fauna species observed within the project area was *Pomatostomus temporalis* (grey-crowned babbler). A review of relevant studies including the Environmental Impact Statement (EIS) for the Mt Owen mine, and the Department of the Environment and Conservation (DEC) and Department of the Environment and Heritage (DEH) databases, identified a number of threatened fauna species that have been recorded within the surface above the project area or are known to occur within the locality and these include:

- *Tyto novaehollandiae* masked owl;
- *Ninox* connivens barking owl;
- *Melithreptus gularis gularis* black-chinned honeyeater;
- *Erythrotriorchis radiatus* red goshawk;
- *Climacteris picumnus* brown treecreeper;
- *Stagonopleura* guttata diamond firetail;
- *Pyrrholaemus sagittatus* speckled warbler;
- *Lathamus discolor* swift parrot ;
- *Pomatostomus* temporalis grey-crowned babbler;
- *Xanthomyza phrygia* regent honeyeater;
- *Chalinolobus dweryi* large-eared pied bat;
- *Miniopterus australis* little bentwing-bat;
- *Miniopterus schreibersii oceanensis* eastern bentwing-bat;
- *Myotis adversus* large footed myotis;
- *Scoteanax rueppellii* greater broad-nosed bat;
- *Mormopterus norfolkensis* eastern freetail-bat;
- *Petaurus norfolcensis* squirrel glider;
- *Dasyurus* maculatus tiger quoll;
- *Petrogale penicillata* brush-tailed rock-wallaby;
- *Phascolarctos cinereus* koala;

- *Pseudomys* oralis Hastings River mouse;
- *Pteropus poliocephalus* grey-headed flying-fox;
- *Litoria aurea* green and golden bell frog; and
- *Mixophyes* iterates southern barred frog.

No endangered populations or ecological communities have been recorded on the surface above the project area and at present, there is no critical habitat listed in the locality. It is highly unlikely that the underground proposal will significantly affect current disturbance regimes including fire and flooding. The proposed modification will not fragment or isolate currently interconnecting or proximate areas of habitat. Some of the threatened species recorded at the project area may be at the western or eastern limits of their distribution in the Hunter Valley and this issue will be fully addressed in the Environmental Assessment.

Based on studies to date, the proposal is not expected to significantly impact upon any threatened species. A more detailed assessment of expected impacts on threatened species habitat will be included in the Environmental Assessment.

4.4 CULTURAL HERITAGE

Preliminary investigations have been undertaken to assess the possible impacts on cultural heritage within the project area. Cultural heritage refers to both Aboriginal and historical cultural heritage and includes sites, artefacts and structures.

As indicated within *Section 2.1,* the natural environment along Bettys Creek and within the areas proposed for open cut mining is not expected to be intact by the time mining commences in Longwall 10 due to Mt Owen operations.

4.4.1 Aboriginal Heritage

Review of previous investigations

The project area has been the subject of a number of previous archaeological investigations in relation to the surrounding coal mines at Glendell (Umwelt 2004), Mt Owen (Umwelt 2003a, Umwelt 2003b) and Ravensworth East (ERM 1999). The area covered longwall panels 7 to 9 were also the assessed by ERM (2005) for inclusion into a subsidence management plan. Twenty two sites have been recorded within the project area and consist of artefact scatters (typically containing a small number of arefacts) and isolated finds. Fifteen of these sites have been the subject of previous mitigation measures involving

surface collection or archaeological salvage at locations within the Mt Owen and Glendell leases. The review of previous archaeological studies in the project area and surrounding region indicates that there is a consistent low density scatter of artefacts. Discrete higher concentrations of artefacts are present in the areas surrounding Bettys Creek. The area within 30 metres of Bettys Creek has higher archaeological sensitivity than the surrounding areas although the Mt Owen operations will result in the realignment of Bettys Creek within the project area prior to the mining of Longwall 10. The distribution of artefacts away from the creek line is far more dispersed and sloping landforms in particular appear to contain limited evidence of human activity.

Potential impacts on Aboriginal heritage

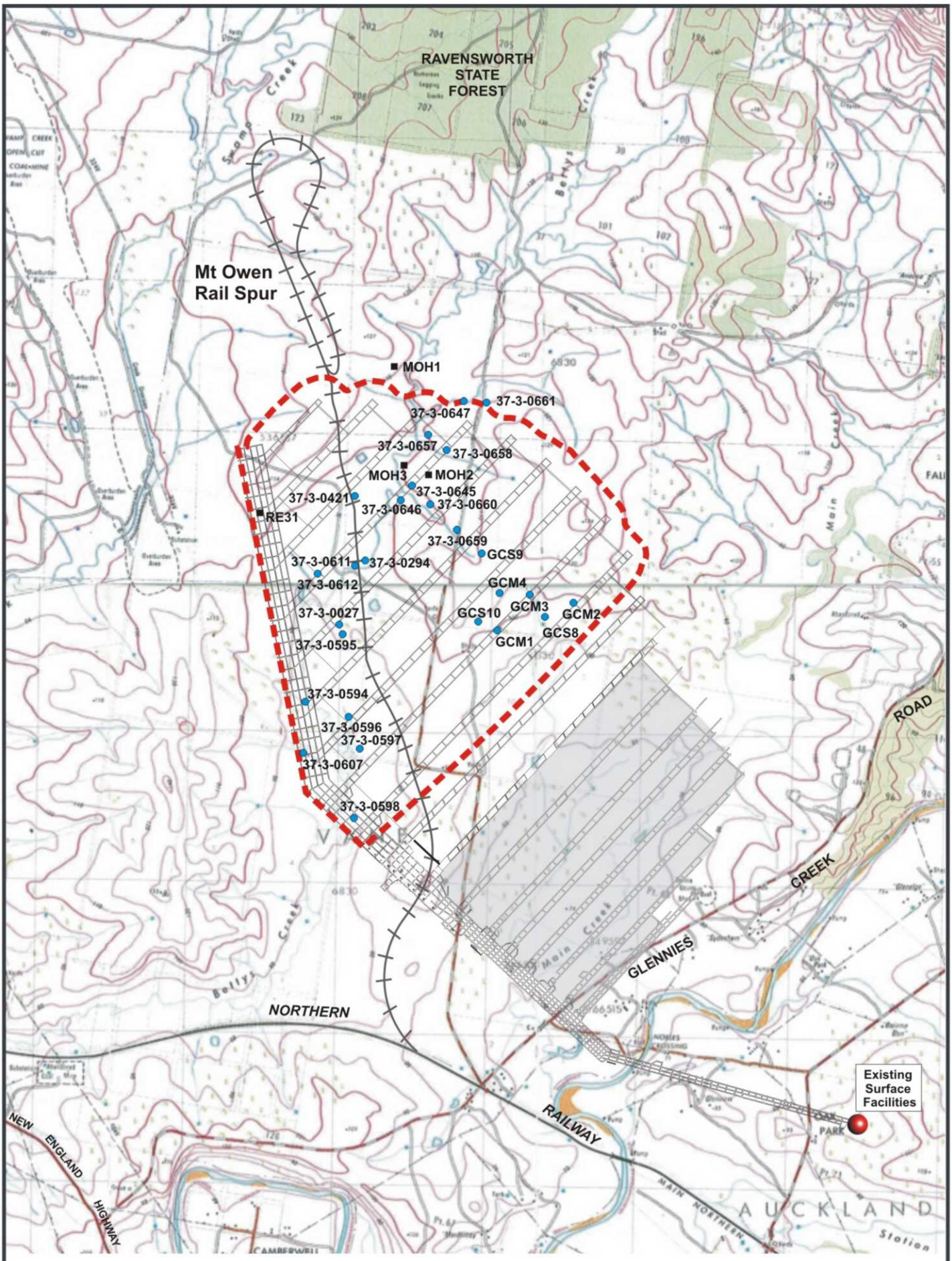
All sites recorded within the project area are stone artefact scatters or isolated finds. These are durable site types and are not expected to be significantly impacted by the proposal. Potential impacts from subsidence include cracking, ponding and changes to watercourse morphology, and impacts that may occur in association with remediation activities that may be undertaken following subsidence.

The overall impact of subsidence is unlikely to be significant. Further specialist investigations may identify specific areas along Bettys Creek that may be impacted by increased erosion or ponding associated with subsidence although these areas will be impacted by the Mt Owen operations prior to the mining of Longwall 10. Mitigation measures may be necessary and will be developed in consultation with the appropriate authorities and groups.

4.4.2 Historical Heritage

Previous investigations (ERM 1999, Umwelt 2003b) have identified three historical heritage sites (*Figure 4.1*) in the project area. These are Site RE31, which consists of a number of timber fence posts, building stumps and gate posts that were interpreted as relating to shearing facilities, Site MOH2, which was described as a 'former occupation site' (Umwelt 2003b) and Site MOH 3, a post and rail fence line (Umwelt 2003b). A historical assessment for the area covered by longwall panel 7 to 9 was conducted by ERM in 2005 and found no historical items listed on the heritage databases, registers or inventories. Early documents supplied to ERM by Ian Webb (Singleton Historical Society and Museum) demonstrate that the old Singletons Ford to Muscle Creek Road that was in use in 1825 traverses the project area although no surface expression has been found.

The historical heritage sites known to occur above panels 10 to 17 consist of structures that could be potentially fragile and may be affected by any subsidence that may occur. Sites RE31, MOH2 and MOH3 have been assessed as being of local significance. Prior to the occurrence of subsidence in these areas, further detailed archival recording may be necessary.



Aboriginal Site (artefact scatter/isolated artefact) Historical Heritage Site Project Area

Source: LPI 1:25 000 Topographic Series, Camberwell Sheet

0 500m

Figure 4.1 **Identified Sites within the Study Area**

Glennies Creek Coal Management Pty Ltd - Glennies Creek Longwall Panels 10 to 17

Jobs/2006/0047481Fg 4.1 Identified Sites.cdr 11 05 2006 SP Environmental Resources Management Australia Pty Ltd

4.5 NOISE

There will be no change to the existing acoustic environment as a result of this proposal.

4.6 AIR QUALITY

There will be no change in the existing air quality as a result of this proposal as the existing gas drainage system, coal handling, preparation and transport facilities will remain the same.

4.7 HYDROLOGY

4.7.1 Surface Water

No significant water dependent ecosystems have been identified within the project area. Bettys Creek is a fourth order ephemeral Schedule 2 stream (Department of Land and Water Conservation (DLWC), 2000) and traverses the project area over panels 10 to 16. It extends from the confluence of Bowmans Creek and Swamp Creek in the south, to north of the Ravensworth State Forest. In its current state it exhibits prolonged periods without flow with small permanent and semi-permanent water holes. Bettys Creek flows into Bowmans Creek approximately 5.9 kilometres upstream of the confluence of Bowmans Creek and the Hunter River. The catchment and riparian zone over the project area has been extensively modified through clearing for mining, logging and grazing, with the channel exhibiting extensive areas of bank erosion and limited riparian vegetation. The catchment area slopes vary from 3 to 4% in the south of the catchment to 20% on upper slopes in the north (GeoTerra, 2005).

Main Creek is located to the south east of the project area and is also a fourth order Schedule 2 stream (DLWC, 2000). Main Creek is ephemeral, has a catchment area of approximately 1750 hectares, and flows into Glennies Creek approximately 3.5 kilometres upstream of the Glennies Creek/Hunter River confluence. Significant headwall erosion is lengthening its channel upstream. Lesser order Schedule 1 ephemeral gullies and small creeks also traverse the project area (DWLC, 2000).

Likely impacts of the proposed continuation of longwall mining upon surface water at the site will be assessed as part of the Environmental Assessment, assuming that the natural environment along Bettys Creek and within the areas proposed for open cut mining will no longer be intact by the time mining commences in Longwall 10 as a result of Mt Owen operations.

4.7.2 Groundwater

Unconsolidated alluvium aquifer systems are associated with Bettys Creek, Main Creek and other minor drainage paths. However, only shallow clay dominated alluvium occurs in the project area.

Aquifer systems are also associated with basement coal measures and comprise a variable sequence of aquicludes (mudstones and shales), aquitards (sandstones) and aquifers (coal seams). GeoTerra (2005) indicate that the pre-subsidence coal measures aquifers within the site have a low recharge rate, with proportionally lower recharge in deeper aquifers. There are no beneficial bedrock aquifers and the low permeability sandstone and coal seams only contain highly brackish or saline water. The higher permeability coal seams are not of suitable quality or permeability to be beneficially used (GeoTerra, 2005).

The likely impacts of the proposed continuation of longwall mining upon groundwater at the site will be assessed as part of the Environmental Assessment.

4.7.3 On Site Water Management

The existing on site water management system will continue and will service the Longwall 10 to 17 operations.

4.8 TRAFFIC

The current employment level of approximately 200 employees will remain unchanged and coal will continue to be transported by rail. As such no changes to the local or regional road network are anticipated.

Forest Road is a minor road, classed as a "Rural Local 3 – Gravel Road" and traverses the area above longwalls 9 to 14, though the section over longwalls 13 and 14 is not accessible to the public. Forest Road provides access to Ravensworth State Forest and to rural land in the area between Glennies Creek Road and the northern Ravensworth district. Some minor subsidence-induced damage and minor disturbance to vehicles using access lanes and Forest Road may occur, however, repairs will be undertaken promptly to rectify any subsidence impacts.

4.9 SUBSIDENCE

The extraction of longwalls in the Middle Liddell seam will potentially result in subsidence of all overlying strata to the surface. The preliminary subsidence assessment indicates that a maximum 1.6m of subsidence may occur above the project area. The main surface improvement on the surface

area is the Mt Owen rail spur and associated infrastructure (SCT, 2006). The Mt Owen rail spur is the subject of a Deed of Release and Indemnity dated 13 December 1995 between Maitland Main Collieries Pty Limited and Xstrata Mt Owen Pty Limited, and current Supreme Court proceedings.

A SMP application is currently being prepared which includes a risk assessment to identify potential risks of subsidence, their likelihood and consequences. Results of these investigations are being used to devise strategies to manage the subsidence impacts from longwalls 10 to 17. Management will be achieved through prevention, mitigation and/or remediation of subsidence impacts as appropriate.

The SMP application will address other surface improvements and natural features including Bettys Creek and tributaries. A program of subsidence monitoring will be extended to include the project area to develop a better understanding of the dynamic subsidence behaviour at GCC.

5 *CONCLUSION*

This application is being made to bring Longwall panels 10 to 17 under Part 3A of the EP&A Act in order to reflect the Department of Planning's current direction, notwithstanding the confirmed application of s74 of the *Mining Act* 1992 under clause 8k of the EP&A Regulation.

This Preliminary Assessment Report has been prepared to outline the proposal to seek approval for the extraction of Longwalls 10 to 17 and associated underground mining activities at Glennies Creek Colliery. The report demonstrates that the project is one to which Part 3A applies. It outlines relevant statutory planning considerations and identifies potential key environmental issues associated with the project.

We trust the information provided in this report is sufficient for the Department of Planning to establish the scope of the Environmental Assessment required for the project approval application under Part 3A of the EP&A Act and look forward to receiving Environmental Assessment requirements from the Director-General which are specific to the project as described and target key issues.

REFERENCES

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