NARRABRI COAL MINE

SECTION 75W MODIFICATION
ENVIRONMENTAL ASSESSMENT

OCTOBER 2009
Project No. WHC-09-01
Document No. EA-E (00307638)

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EXECUTIVE SUMMARY

Background

The Narrabri Coal Mine (NCM) is located approximately 28 kilometres (km) south-east of Narrabri and approximately 65 km north-west of Gunnedah in the Gunnedah Basin in New South Wales (NSW) in Mining Lease (ML) 1609.

Narrabri Coal Operations Pty Ltd (NCOPL) is proposing to develop the NCM in two stages.

Stage 1 of the NCM was approved by the NSW Minister for Planning in November 2007 under Part 3A of the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act). It includes the development of an continuous miner underground mining operation, a crushing and sizing plant and loading of product coal into train wagons for transportation to Newcastle. Construction works commenced at the approved NCM in January 2008.

Stage 2 of the NCM would involve conversion of the continuous miner operation to a longwall mining operation, and the installation of additional coal processing and handling infrastructure to increase the annual production rate from 2.5 million tonnes per annum (Mtpa) to 8 Mtpa. NCOPL submitted an Environmental Assessment for Stage 2 of the NCM (the Stage 2 EA) to the NSW Department of Planning (DoP) on 28 August 2009 for the DoP's adequacy assessment. Approval for Stage 2 is pending.

Some of the Stage 2 construction activities involve relatively long construction timeframes and/or are precursors to other construction or development activities. NCOPL is seeking approval to undertake these works via a modification to the Stage 1 Project Approval under Section 75W of the EP&A Act while the Stage 2 EA is being assessed by the DoP. The proposed preliminary construction works (herein referred to as the Modification) are the subject of this Environmental Assessment document.

Overview of the Proposed Modification

The proposed Modification includes a number of changes to the currently approved Stage 1 NCM. The key aspects of the Modification include:

- A change in the sequence of underground panel roadway development.
- Construction and use of a ventilation shaft (the West Mains ventilation shaft) and associated surface infrastructure in area above the West Mains roadway between Stage 2 Longwalls 2 and 25), in place of the main ventilation drift.
- Construction and use of a small diameter vertical ventilation shaft (i.e. rear of panel ventilation shaft), associated with Stage 2 Longwalls 1 to 3.
- Construction and use of gas (and potentially water) pre-drainage infrastructure, involving drilling from the surface into and along the coal seam, generally within the area of Stage 2 Longwalls 1 to 3.
- Construction (but not operation) of a Coal Handling and Preparation Plant (CHPP), immediately south of the run-of-mine (ROM) coal stockpile, within the pit top area.
- Construction and use of supporting infrastructure (e.g. access tracks, electricity spur lines, surface water control features and gas/water pipelines).
- Additional surface disturbance of approximately 34.6 hectares (ha) of primarily cleared agricultural land. This surface disturbance would be associated with: ventilation shafts; pre-drainage boreholes; and associated supporting infrastructure (e.g. access tracks, electricity spur lines and gas/water pipelines).

- Employment of an additional 35 people over a period of approximately 12 months (i.e. during construction of the abovementioned Modification components).

These proposed changes would be located within ML 1609 and within the area assessed and approved via the Stage 1 EA.

Environmental Assessment

Land Resources

The surface disturbance associated with the Modification would result in a change in the landuse of these areas during the life of the NCM (i.e. they would not be available for agricultural use while mining activities are occurring). However, it is expected that following mine closure and rehabilitation the site would be returned to agricultural use, with some areas rehabilitated to native woodland communities comparable to the pre-mining situation. NCOPL would also implement management measures to minimise the potential impacts of the Modification on soil resources.

The proposed installation of the ventilation shaft, gas drainage activities and construction of the CHPP would involve limited cut and fill earthworks and would not significantly impact the landforms of the local area.

Gas drainage activities would be temporary in nature, and would look similar to the exploration drilling activities which have been ongoing over ML 1609 for a number of years. Beyond a distance of a few hundred metres, the activities would be virtually imperceptible with dust suppression activities undertaken to reduce dust generation, likely to be the most noticeable aspect of these operations. Once completed, the gas drainage sites would be rehabilitated to re-establish the pre-existing vegetation.

Noise and Blasting

It is considered that the Modification would not pose any significant additional noise generation in comparison to the construction or operation of the approved NCM. Regular noise monitoring would continue to be undertaken to verify continued compliance with applicable Project Approval and Environmental Protection Licence noise criteria and to implement management measures if necessary.

Some limited blasting may be required during the establishment of the West Mains ventilation shaft. These blasts would be smaller than blasting that has been undertaken to date. Any blasts required for the West Mains ventilation shaft construction would be designed to meet applicable blast vibration and overpressure criteria at the nearest non-company owned residences.

Construction Dust Generation

Existing NCM dust management measures would be applied to the Modification construction activities. With the implementation of these measures it is not anticipated that the construction of the ventilation shafts, CHPP and gas pre-drainage would significantly alter the dust generation of the approved NCM.

Greenhouse Gas Generation

The gas pre-drainage infrastructure would enable extraction of seam gases prior to the initial development and operation of the Stage 2 longwall mining operation.

Aboriginal Heritage

There are no known Aboriginal heritage sites located at the CHPP construction site.

When constructing ventilation and gas pre-drainage infrastructure for Longwalls 1 to 3, relevant Aboriginal heritage sites would be demarcated to avoid accidental damage. Disturbance to other known Aboriginal heritage sites located above Panels 1 to 3 would be avoided where practicable. In the event that avoidance of disturbance is not considered to be practicable, salvage of the artefacts would be undertaken.

Site preparation and topsoil stripping activities would be undertaken in accordance with the Aboriginal Cultural Heritage Management Plan. Cultural heritage site education would also be undertaken as a component of induction for staff and contractors who may come to site to work on the Modification.

Non-Aboriginal Heritage

NCOPL completed a desktop search for Non-Aboriginal heritage listings within the extent of ML 1609 and surrounds. This desktop review indicated that the nearest registered non-Aboriginal heritage sites were located in Narrabri.

Archaeological Surveys and Reports Pty Ltd also completed a field survey to record any structures, places or relics of non-Aboriginal heritage significance within ML 1609.

Water Resources

The Modification would involve the continued implementation of existing water management controls, as well as an increase in the capacity of SB1 and an additional sediment basin (SB2 – to provide additional capacity for the collection and storage of dirty runoff from the coal processing area) and a new storage dam (SD6) to collect potentially dirty runoff from the initial ventilation shaft area. Further, surface water flows within each gas pre-drainage or ventilation shaft area required for the Modification would be managed in accordance with an Erosion and Sediment Control Plan.

In the event of a major hydrocarbon spill, the following actions would be undertaken: contaminated soil would be collected and transported to an approved waste depot or remediated safely within ML 1609; pits would be constructed around the spill with sufficient hydraulic gradient to capture seepage water and contaminated material, enabling the pits to be pumped out; and local groundwater would be monitored for signs of further contamination.

Flora and Fauna

No threatened flora or fauna species, populations, ecological communities or their habitats are likely to be significantly affected by the proposed modification, considering aspects such as the extent of potential habitat for the species, the small scale of the proposed modification and the already generally disjunct nature of the habitat which would be removed. Given the small area of vegetation disturbance and the application of mitigation measures, the proposed modification is unlikely to significantly increase the flora and fauna impacts of the currently approved NCM.

Hazard and Risk

The proposed construction of the ventilation shafts, gas pre-drainage infrastructure and CHPP would not significantly alter the risk profile of the approved NCM. The operation of the CHPP is not proposed as a component of this Modification. The existing management and mitigation measures at the NCM would be applied to the Modification where required to minimise the hazards and risks associated with the development.

Transport

The development of the CHPP, West Mains ventilation shaft and pre-mine gas drainage infrastructure would result in some limited traffic generation during construction of the Modification. These movements would be generally within the range of the Stage 1 traffic movements and are not expected to result in any additional traffic safety or traffic capacity issues.

Social and Economic Aspects

The NCM is providing employment and business opportunities in the Narrabri Local Government Area (LGA) and adjoining Gunnedah LGA.

The Modification would provide for the employment of an additional 35 staff during construction of the Modification components (for approximately 12 months) and would also allow NCOPL to rapidly develop Stage 2 by establishing some long lead time components, should Stage 2 of the NCM be approved.

The modified NCM would be unlikely to place any strain on existing community infrastructure and housing.

1 INTRODUCTION

1.1 BACKGROUND AND JUSTIFICATION FOR THE PROPOSED MODIFICATION

This Environmental Assessment (EA) has been prepared by Narrabri Coal Operations Pty Ltd (NCOPL) to support a request to modify the Narrabri Coal Mine (NCM) Project Approval (Attachment 1).

The NCM is owned and operated by NCOPL, which is a joint venture between Narrabri Coal Pty Ltd (70%), Upper Horn Investments (Australia) Pty Ltd (7.5%), J-Power (7.5%), EDF Trading (7.5%), and a Korean consortium consisting of Daewoo International Narrabri Investment Pty Ltd and Kores Narrabri Pty Ltd (7.5%). Narrabri Coal Pty Ltd is a 100% subsidiary Company of Whitehaven Coal Limited, a publicly listed Company with several mining interests in the Gunnedah region of New South Wales (NSW).

The NCM is located in Mining Lease (ML) 1609 approximately 28 kilometres (km) south-east of Narrabri and approximately 65 km north-west of Gunnedah in the Gunnedah Basin in NSW (Figures 1 and 2).

NCOPL propose to develop the NCM in two stages.

Stage 1 of the NCM has been approved and includes the development of a continuous miner underground mining operation (with an annual production rate of 2.5 million tonnes per annum [Mtpa]), a crushing and sizing plant and loading of product coal into train wagons for transportation to Newcastle. The potential environmental impacts associated with the development of Stage 1 of the NCM were assessed in the *Narrabri Coal Project Environmental Assessment* (the Stage 1 EA) (Narrabri Coal Pty Ltd [NCPL], 2007a). The Minister for Planning granted Project Approval 05_0102 for the NCM (Stage 1) under Part 3A of the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act) on 13 November 2007. Construction works commenced at the approved NCM in January 2008. The status of the approved NCM is detailed in Section 1.2.

Stage 2 of the NCM would involve conversion of the continuous miner operation to a longwall mining operation, and the installation of additional coal processing and handling infrastructure to increase the annual production rate from 2.5 to 8 Mtpa. NCOPL submitted an Environmental Assessment for Stage 2 of the NCM (the Stage 2 EA) to the NSW Department of Planning (DoP) for assessment of adequacy on 28 August 2009. Approval for Stage 2 is pending.

Some of the Stage 2 construction activities involve relatively long construction timeframes and/or are precursors to other construction or development activities. In particular, construction of the main ventilation shaft (the West Mains ventilation shaft), installation of gas pre-drainage holes and associated infrastructure, and construction of the coal handling and preparation plant (CHPP). NCOPL is seeking approval to undertake these works via a modification to the Stage 1 Project Approval under Section 75W of the EP&A Act while the Stage 2 EA is being assessed by the DoP. The proposed preliminary construction works (herein referred to as the Modification) are the subject of this Environmental Assessment document.

1.2 STATUS OF THE APPROVED NCM

A summary of the construction status of the approved Stage 1 NCM development components is provided below.

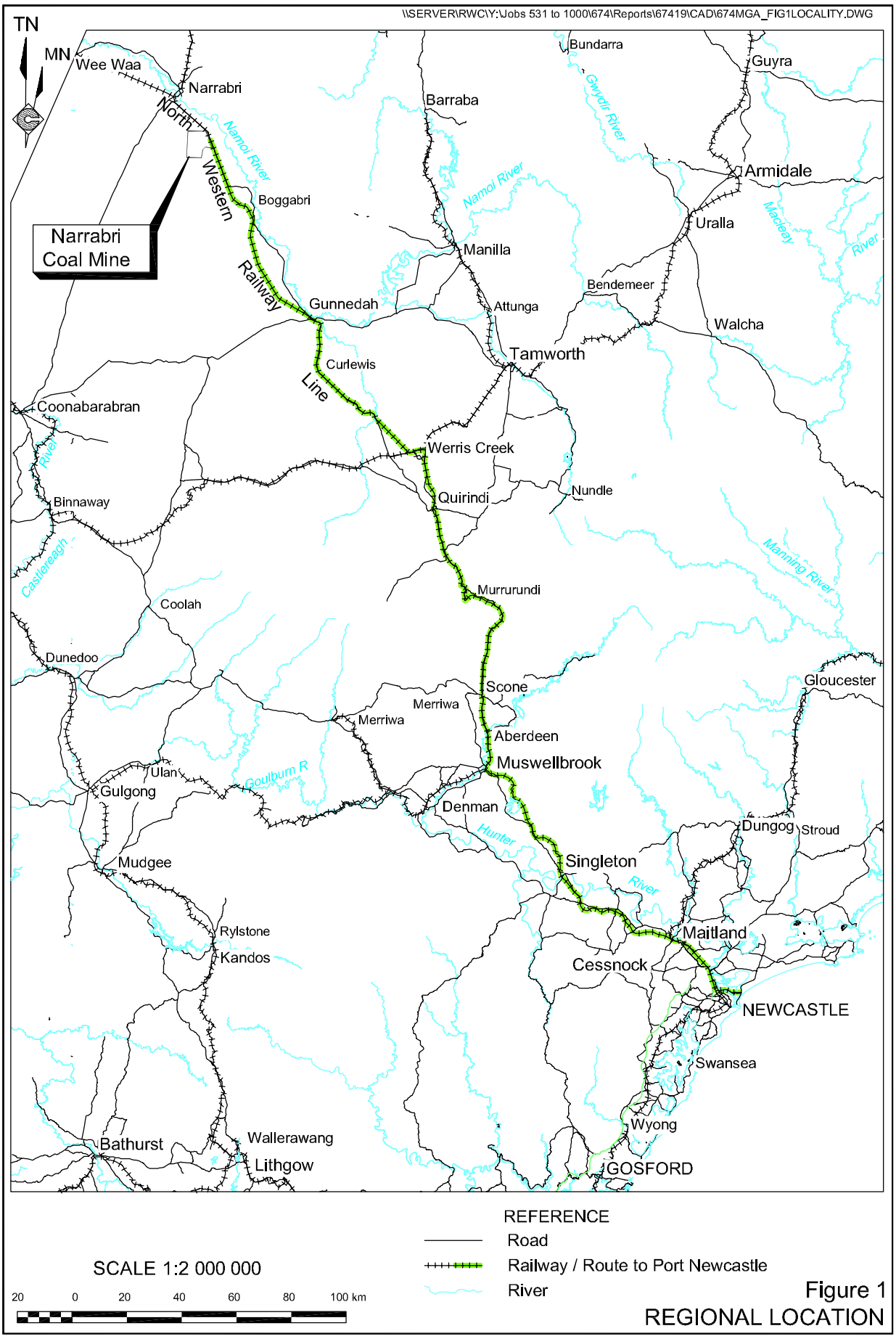


Figure 1
REGIONAL LOCATION

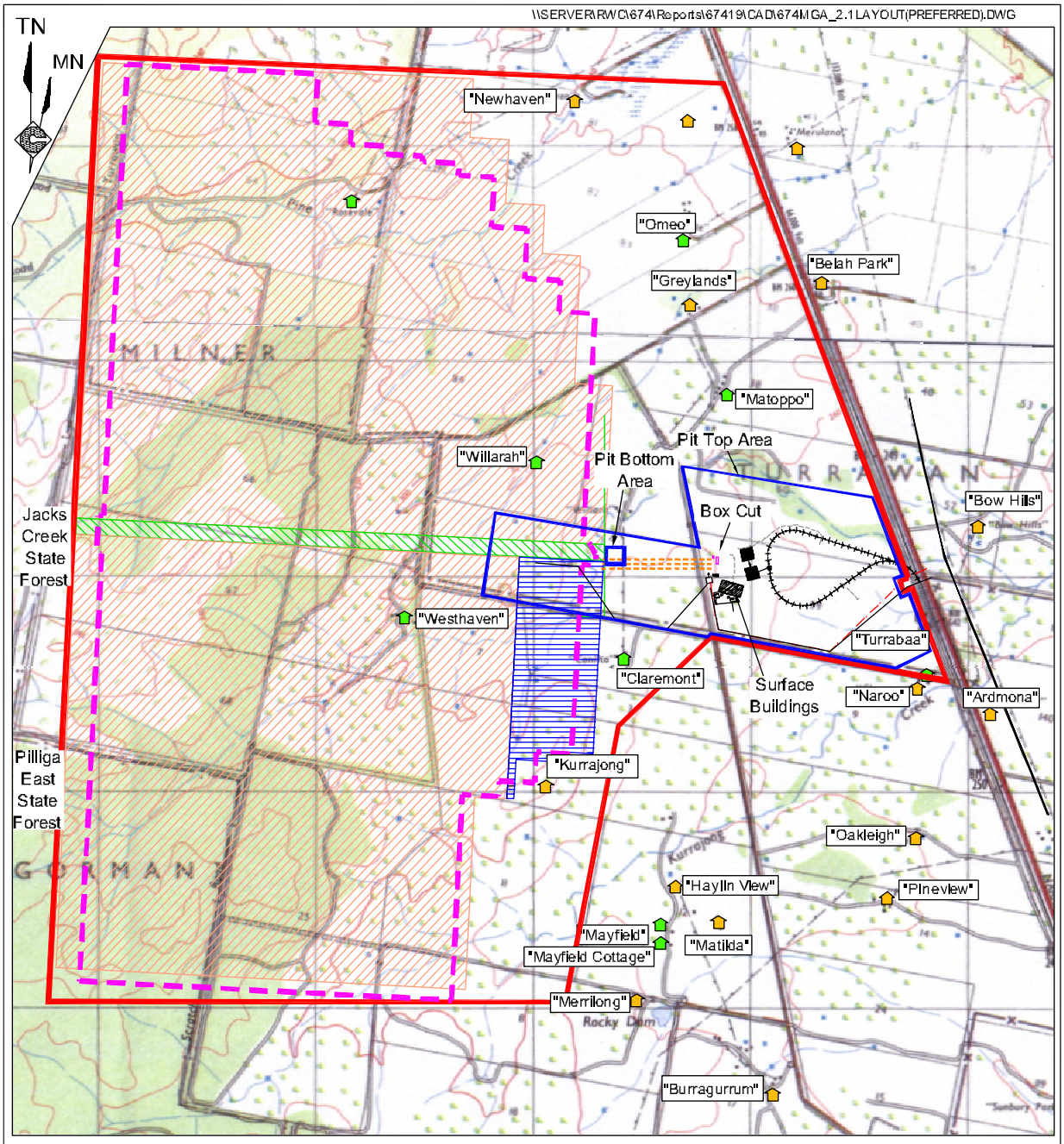


Figure 2
APPROVED NCM INDICATIVE LAYOUT

Completed Development Components

The approved NCM development components completed to date include:

- mine access roads and major earthworks;
- main office, administration area and light vehicle car park;
- electrical sub-station;
- run-of-mine (ROM) coal and product coal pad hard stands;
- box cut and mine portals;
- ventilation surface infrastructure (located within the box cut);
- rail loop; and
- water storage and evaporation dams (lined) and the drift conveyor system.

Figure 3 provides a recent aerial photograph (dated December 2008) identifying the various completed development components, as well as the overall extent of the approved Stage 1 components.

Ongoing Development Components

The following approved Stage 1 NCM components are currently under construction (estimated completion dates in parentheses):

- construction of the coal crushing station (October 2009);
- completion of the mine drifts to pit bottom (November 2009); and
- commissioning of the train load-out bin and train loader (November 2009).

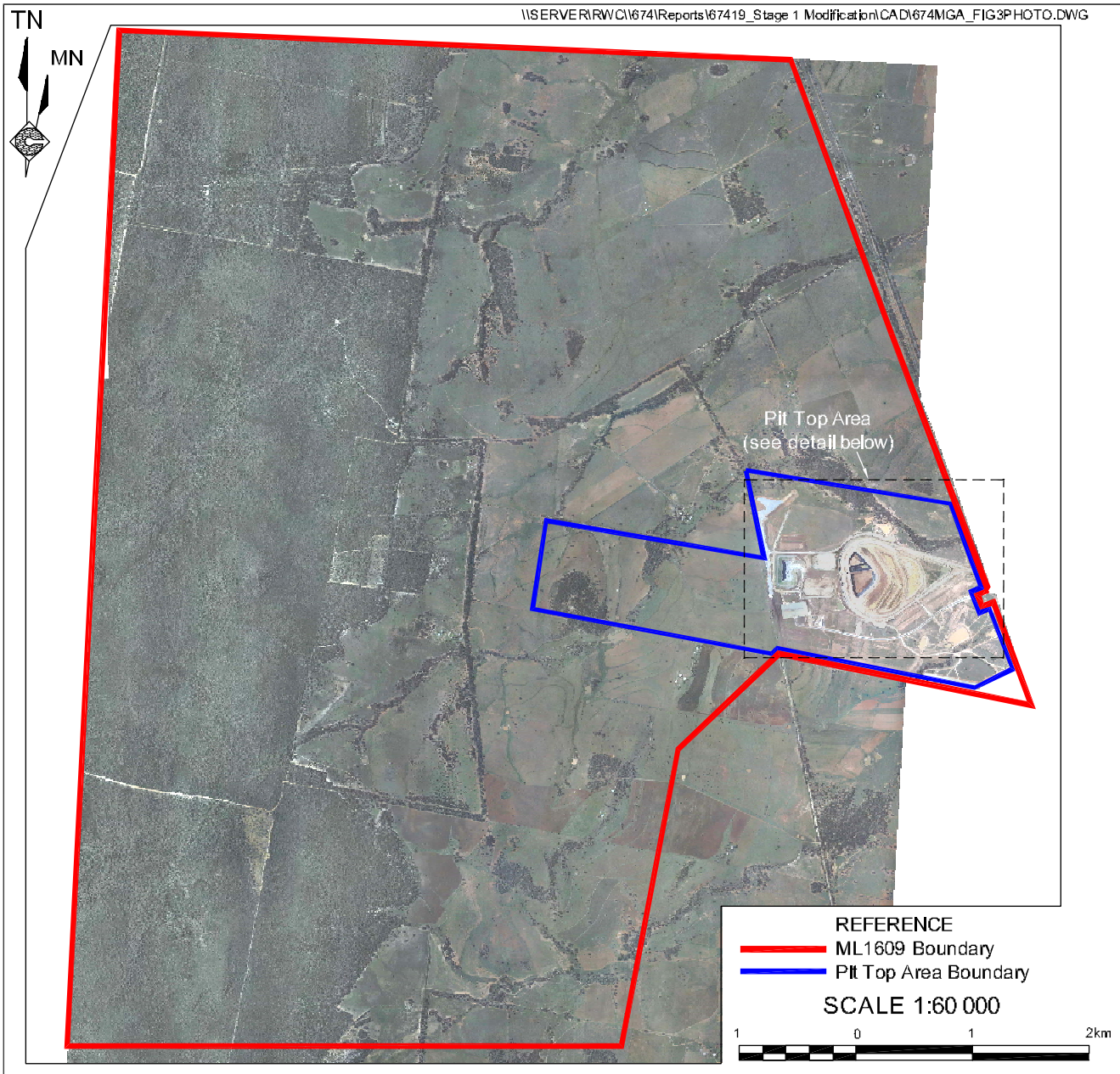
It is estimated that coal production, including off-site transport of coal by rail, would commence in January 2010.

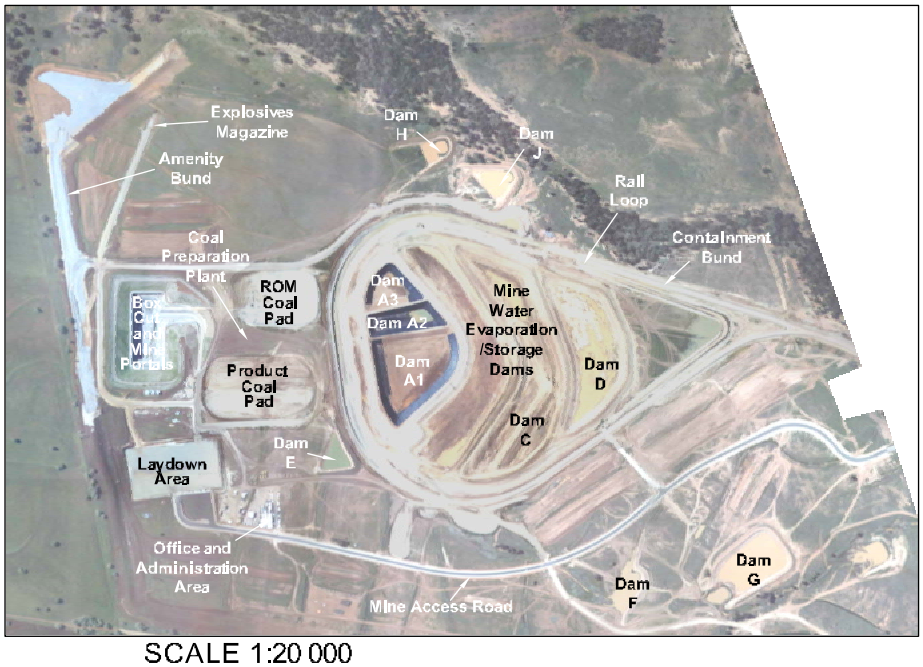
The approved Stage 1 NCM has an operational life of 21 years.

1.3 OVERVIEW OF THE MODIFICATION

The Modification includes a number of changes to the currently approved Stage 1 NCM. The key aspects of the Modification include:

- A change in the sequence of underground panel roadway development.
- Construction and use of a ventilation shaft (the West Mains ventilation shaft) and associated surface infrastructure in the area above the West Mains roadway between Stage 2 Longwalls 2 and 25), in place of the main ventilation drift.
- Construction and use of a small diameter vertical ventilation shaft (i.e. rear of panel ventilation shaft), associated with Stage 2 Longwalls 1 to 3.
- Construction and use of gas (and potentially water) pre-drainage infrastructure, involving drilling from the surface into and along the coal seam, generally within the area of Stage 2 Longwalls 1 to 3.





SCALE 1:20 000

200 0 200 400 600 800 1000 m

Base Photo Source: Fugro Spatial Solutions Pty Ltd - Date: 19 November 2008

Figure 3
AERIAL PHOTOGRAPH
OF ML1609

- Construction (but not operation) of a CHPP, immediately south of the ROM coal stockpile, within the pit top area.
- Construction and use of supporting infrastructure (e.g. access tracks, electricity spur lines and gas/water pipelines).
- Additional surface disturbance of approximately 35 hectares (ha) of primarily cleared agricultural land. This surface disturbance would be associated with: ventilation shafts; pre-drainage boreholes; and associated supporting infrastructure (e.g. access tracks, electricity spur lines and gas/water pipelines).
- Employment of an additional 35 people over a period of approximately 12 months (i.e. during construction of the abovementioned Modification components).

These proposed changes would be located within ML 1609 and within the area assessed and approved via the Stage 1 EA (Figure 4).

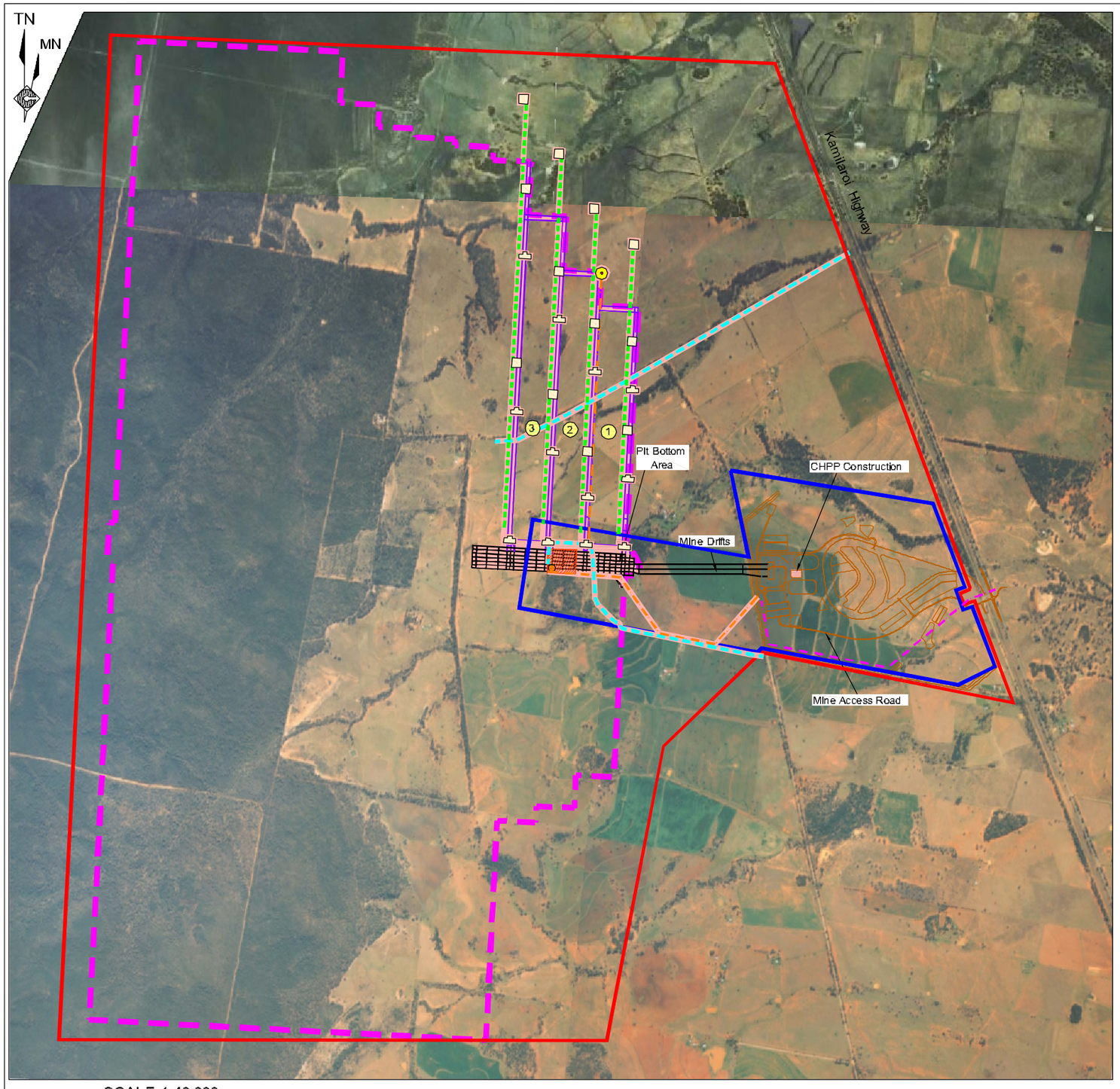
Table 1 provides a summary comparison of the currently approved Stage 1 NCM and the NCM including the Modification (i.e. the modified NCM).

A detailed description of the proposed changes is provided in Section 3.

Table 1
Comparison of the Currently Approved and Modified NCM

Project Feature	Approved NCM	Modified NCM
Annual ROM and Product Coal Production	Maximum annual rate of approximately 2.5 Mtpa.	No change.
Indicative Underground Mining Area	Indicative mining area of approximately 3,630 ha.	No change.
Surface Facilities Area	Surface facilities area of approximately 465 ha.	No change.
Surface Disturbance Area	Surface disturbance area of approximately 48.2 ha.	Additional surface disturbance area of approximately 34.6 ha associated with: • West Mains ventilation shaft area – approximately 5 ha. • Rear of panel ventilation shaft area above Stage 2 Longwall 2 – 0.25 ha. • Pre-drainage drilling sites – approximately 9 ha (includes surface to in-seam borehole drill sites, generally above Stage 2 Longwalls 1 to 3). • Minor supporting infrastructure (access tracks, electricity spur lines and gas/water pipelines) – approximately 20.3 ha.
Life of Mine	Operational life of 21 years.	No change.
Underground Crushing	Coal mined by the continuous miners is broken through underground breaker feeders, prior to transfer onto the conveyor belt system to the ROM surface stockpile area, via a conveyor drift and portal.	No change.
ROM Coal Stockpiling	ROM coal stockpile area with a capacity of approximately 150,000 tonnes (t).	No change.
Coal Crushing/ Sizing/Preparation	Coal loaded from ROM stockpile into the crusher feed hopper through a reclaimer. Coal is then sized and crushed by a double roll crusher. After crushing, the coal is stockpiled by a stacking conveyor onto the product stockpile area.	No change to coal crushing/sizing. Construction (not operation) of a CHPP, immediately south of the ROM coal stockpile, within the pit top area.

\\SERVER\RWC\674\Reports\67419_Stage 1 Modification\CAD\674MGA_FIG4SURFACEDIST.DWG



REFERENCE
- ML1609 Boundary
- Pit Top Area Boundary
- Indicative Limit of Underground Workings
- Approved Stage 1 Disturbance within the Pit Top Area
- Installed Power Line
- **Proposed Modification Areas / Activites**
- Proposed All Weather Unsealed Access Road
- Proposed Gas Pre-Drainage Infrastructure Access Road
- Proposed Panel No.
- Proposed Panel Development
- Proposed Power Line
- Proposed Ventilation Shaft Area
- Proposed Ventilation Shaft Location
- Proposed Rear of Panel Ventilation Shaft
- Proposed Gas Pre-Drainage Infrastructure
- Proposed Mains Development

SCALE 1:40 000

0.5 0 0.5 1.0 1.5 2.0 km

Base Photo Source: Geo-spectrum (Australia) Pty Ltd - Date of Photo: 5 December 2005

Figure 4
INDICATIVE LAYOUT WITH MODIFICATION

Table 1 (Continued)
Comparison of the Currently Approved and Modified NCM

Project Feature	Approved NCM	Modified NCM
Product Coal Stockpiling	Product coal stockpile area with a capacity of approximately 150,000 t.	No change.
Rail Loading	Rail loop (approximately 3.36 km in length) from the North Western Branch Railway, located immediately east of ML 1609, to the pit top area to provide for direct product loading of trains via an overhead load-out bin.	No change.
Train Movements per Day to Port of Newcastle	An average of two to three trains would be loaded and dispatched each day (with the rate to vary to meet shipping arrival schedules at the Port of Newcastle).	No change.
Train Movement Hours	24 hours per day, seven days per week.	No change.
Underground Development and Mining	West Mains roadway (Area A) bisecting the southern and northern areas within the indicative limit of underground workings. Continuous miner units to progressively develop north-south oriented panel roadways (in both areas B and C) and secondary partial extraction leaving stable pillars (Area B and potentially Area C) or to form coal blocks (to be extracted as part of Stage 2 operations).	No change to mining methods or indicative underground mining area. Change in the sequence of panel roadway development.
Key Underground Mining Equipment	Continuous miner; shuttle cars; breaker feeder; EIMCO (LHD); man transport vehicle; roof bolting machine; and panel conveyor belt.	No change.
Key Surface Equipment	Dozer; ventilation fan; conveyors; and double-roll crusher.	As per approved NCM but with ventilation fan (operational) in a new location and CHPP (not operational).
Surface Construction Equipment	Crane; excavator; dozer; haul trucks; scraper; grader; compactor; compressor; water cart; gravel truck; and generator.	As per the approved NCM but with additional number of fleet items associated with construction of: West Mains ventilation shaft and surface infrastructure; rear of panel ventilation shaft and surface infrastructure; gas pre-drainage boreholes and surface infrastructure; CHPP; and access tracks.
Ventilation	Ventilation via a ventilation drift. The exhaust of the ventilation drift is located within the box cut excavation. The ventilation surface infrastructure (located within the box cut, below natural ground level) consists of a fan house and evase approximately 10 metres (m) in height.	Construction of the West Mains ventilation shaft and associated surface infrastructure (i.e. exhaust) in area above the West Mains roadway between Stage 2 Longwalls 2 and 25. Addition of the small diameter rear of panel ventilation shaft.
Gas Drainage	Additional specialist investigations to be continued with regard to gas quantities and safety limits across the potential mining areas.	Pre-draining gas within Stage 2 Longwalls 1 to 3 by in-seam drilling and surface to in-seam pre-drainage of coal seam gas using medium radius drilling (MRD), involving drilling from the surface into and along the coal seam.
Water Supply and Management	Annual operational water demand of approximately 120 megalitres (ML). Approximately 85 ML of this annual requirement to be supplied from underground dewatering. Water used for dust suppression underground and in the coal handling areas and unsealed roads of the pit top area. Install a reverse osmosis (RO) plant for all underground and surface dust suppression requirements, when observed dewatering volumes exceed operation requirements by a sufficient amount to sustain the operation of an RO plant. Evaporation, treated water storage and brine ponds to store treated water and waste water from the RO plant.	No change in volume of water from underground dewatering. Water obtained from gas drainage boreholes to be managed as per water obtained from underground dewatering.

Table 1 (Continued)
Comparison of the Currently Approved and Modified NCM

Project Feature	Approved NCM	Modified NCM
Waste Rock Management	Waste rock to be produced from a number of sources during construction (i.e. box cut, drift development and rail loop cuttings) and to be used in the construction of site landforms (e.g. amenity bunds and stockpile pads).	Rock mined from the ventilation shafts to be used to construct the perimeter amenity bund around the pit top area and ROM coal and product coal stockpile pads. Waste from the construction of the mine drifts would also be used in the construction of access roads to the ventilation shaft.
Power Supply	Electricity supplied to site via a spur line from a 66 kilovolt (kV) transmission line located to the east of the Kamilaroi Highway. The spur line is directed to a substation within the pit top area where it is converted to 11 kV for use at the site offices, buildings and coal crushing/sizing. Minor spur lines supplying power to supporting infrastructure as required.	No change to electricity supply to site. Change to the location of minor spur lines and additional minor spur lines to the ventilation shafts and rear of panel ventilation shaft.
Road Transport Requirements	Construction road traffic: heavy vehicles delivering construction materials and machinery to the pit top area, as well as workforce light vehicle movements. Operational road traffic: workforce, consumables, visitors and general deliveries and maintenance vehicles.	No change.
General Surface Facilities and Supporting Infrastructure	General surface facilities including site offices, switch rooms, workshop, compressor shed, wash bay, hardstand, fuel storage and re-fuelling facilities and septic system(s). Supporting infrastructure including minor access tracks and electricity spur lines.	Additional minor supporting infrastructure outside the pit top area (e.g. access tracks, electricity spur lines surface water control features and gas/water pipelines).
Workforce	Construction workforce (employees and on-site contractors) of approximately 80 people. Operational workforce (employees and on-site contractors) of approximately 94 to 113 people (dependent on the number of continuous miners in operation).	Employment of an additional 35 people over a period of approximately 12 months (i.e. during construction of the Modification components).
Construction Hours	Construction hours (7 days per week): • Vegetation clearance/soil removal – 7.00 am to 6.00 pm. • Surface infrastructure and pit top area construction – 7.00 am to 10.00 pm. • Mining – 24 hours per day. • Raw materials/supply delivery – 7.00 am to 10.00 pm.	As per approved NCM with: • Shaft construction – 24 hours per day.
Operating Hours	Operating hours: mining 24 hours per day 7 days per week.	No change.

The Modification comprises a change in the sequence of underground panel roadway development, the construction and use of ventilation shafts, pre-drainage of coal seam gas, the construction (but not operation) of a CHPP within the pit top coal handling area and changes to supporting infrastructure.

Section 4 describes the potential environmental impacts of the Modification and discusses how the environmental management and monitoring programmes at the NCM would be applied to manage potential environmental impacts.

1.3.1 Land Tenure

Land tenure relevant to the NCM is shown on Figure 5. The area of land to which the Project Approval is relevant includes that underlying the mining lease. ML 1609 encompasses approximately 5,210 ha and is predominantly cleared for grazing and cropping. The mining lease is located on lands designated zone General Rural (1a) under the *Narrabri Local Environmental Plan, 1992* (Narrabri LEP).

NCOPL owns approximately two-thirds of the freehold land above the limit of planned underground workings and will continue to review opportunities to purchase additional landholdings.

1.4 LEGISLATIVE FRAMEWORK

Environmental Planning and Assessment Act, 1979

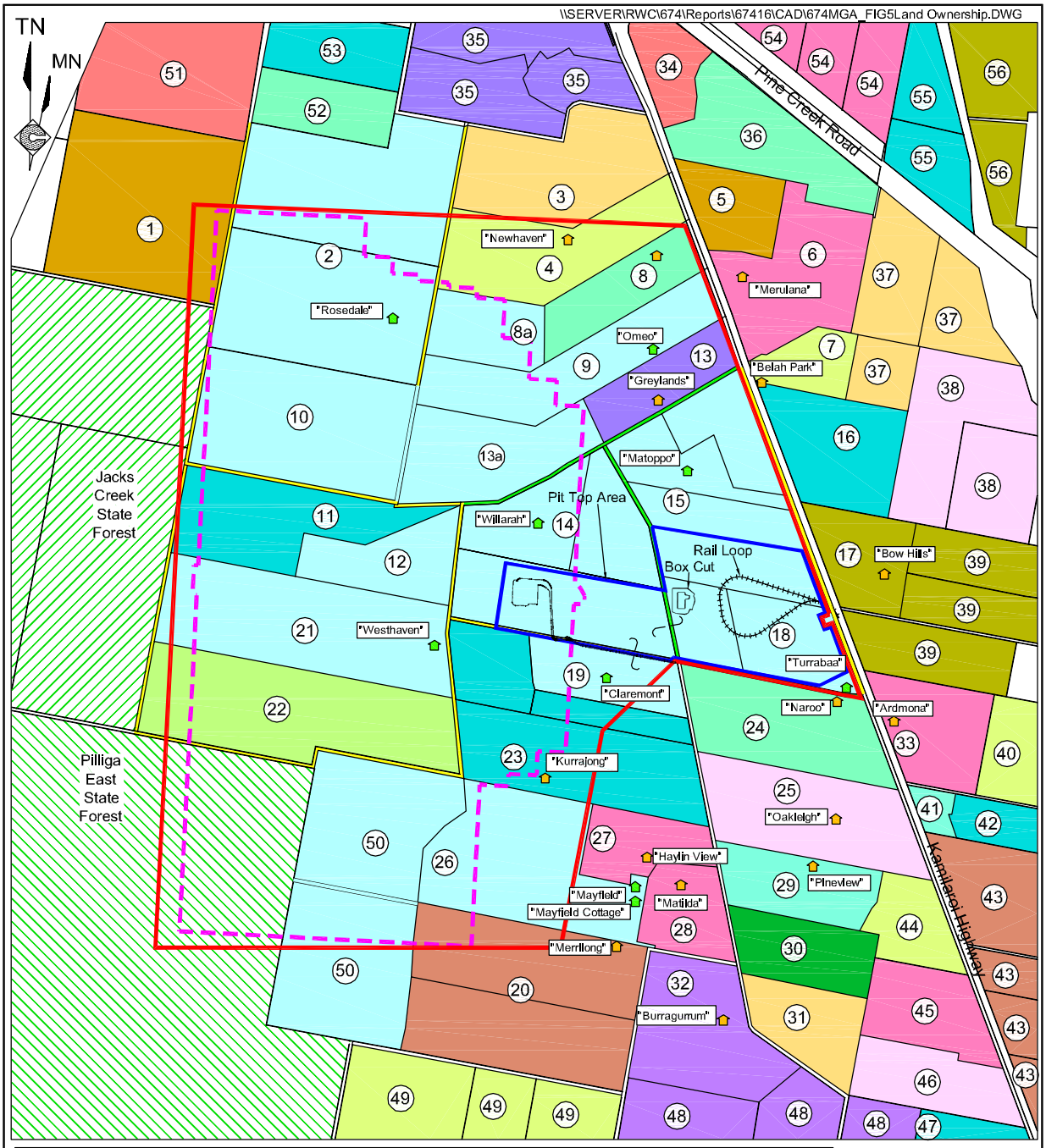
As described in Section 1.1, Stage 1 of the NCM was approved by the NSW Minister for Planning on 13 November 2007 (Project Approval 05_0102 – Attachment 1) following submission of the Stage 1 EA and a Preferred Project Report (NOCPL, 2007b).

In August 2009 NOCPL consulted with the DoP with regard to the Modification. Based on this consultation, this EA has been prepared under Section 75W of the EP&A Act to assess the Modification. Section 75W of the EP&A Act states:

> 75W Modification of Minister's approval
>
> *(1) In this section:*
>
> *Minister's approval means an approval to carry out a project under this Part, and includes an approval of a concept plan.*
>
> *modification of approval means changing the terms of a Minister's approval, including:*
>
> *(a) revoking or varying a condition of the approval or imposing an additional condition of the approval, and*
>
> *(b) changing the terms of any determination made by the Minister under Division 3 in connection with the approval.*
>
> *(2) The proponent may request the Minister to modify the Minister's approval for a project. The Minister's approval for a modification is not required if the project as modified will be consistent with the existing approval under this Part.*
>
> *(3) The request for the Minister's approval is to be lodged with the Director-General. The Director-General may notify the proponent of environmental assessment requirements with respect to the proposed modification that the proponent must comply with before the matter will be considered by the Minister.*
>
> *(4) The Minister may modify the approval (with or without conditions) or disapprove of the modification.*
>
> *…*

Local Environmental Plan

The NCM is located in the Narrabri Local Government Area (LGA). The Modification area (Figure 4) is wholly within lands zoned 1(a) (General Rural) under the Narrabri LEP.



LAND OWNERSHIP							
1	N. & F. King	17	J. & R. Stieger	35	J. & A. Collins	53	J. Westwood
2	Narrabri Coal Pty Ltd	18	Narrabri Coal Pty Ltd	36	S. & J. Holman	54	S. & J. McGowan
3	A. & L. Grumley	19	Narrabri Coal Pty Ltd	37	Boonery Pty Ltd	55	J. & D. Zimmerman
4	K. & J. Scott	20	R. & S. Chappel	38	C. & R. Melbourne	56	J. & W. Baylis
5	W. & A. Tick	21	Narrabri Coal Pty Ltd	39	J. & R. Stieger		
6	P. Smart	22	D.,P.,B. & N. Gmcarski	40	J. Richards		
7	G. & C. Sevil	23	J. & G. Lennox	41	G. Smith		
8	Property 8 of J. & M. Bish	24	M. W. Foster	42	S. Murton		
8a	Narrabri Coal Operations Pty Ltd	25	C. Towns	43	P. Webb		
9	Narrabri Coal Operations Pty Ltd	26	Narrabri Coal Pty Ltd	44	T., W. & S. Tapscott		
10	Narrabri Coal Pty Ltd	27	W. Chapman	45	M. Thomas		
11	P. Bradbury	28	W. Chapman	46	B. Scott		
12	Narrabri Coal Pty Ltd	29	C. & D. Kirkby	47	B. & A. Mainey		
13	M. & D. White	30	M. Thomas	48	G. & L. Stuart		
13a	Narrabri Coal Operations Pty Ltd	31	B. Scott	49	G. & L. Clarke		
14	Narrabri Coal Pty Ltd	32	G. & L. Stuart	50	Narrabri Coal Pty Ltd		
15	Narrabri Coal Pty Ltd	33	P.C. Webb	51	J. Irvine		
16	C. Healion	34	J. Pattison	52	S. Smith		

REFERENCE
- ML1609 Boundary
- Pit Top Area Boundary
- Underground Mining Area
- Residence (Project Related)
- Residence (Non-project Related)
- Property Owned by Narrabri Coal Operations Pty Ltd or related company
- Crown Land
- Crown Road
- Council Road

SCALE 1:75 000

1 0 1 2 3 4km

Land Ownership Source: Dept. of Lands / Narrabri Coal Operations Pty Ltd

Figure 5
LAND TENURE

Clause 10 of the Narrabri LEP relevantly provides:

(1) The Council shall not consent to an application to carry out development on land within Zone No 1 (a) or 1 (c) unless it has taken into consideration, if relevant, the effect of the carrying out of that development on:

(a) the present use of the land, the potential use of the land for the purposes of agriculture and the potential of that land for sustained agricultural production,

(b) vegetation, timber production, land capability (including soil resources and soil stability) and water resources (including the quality and stability of water courses and ground water storage and riparian rights),

(c) the future recovery of know or prospective areas of valuable deposits of minerals, coal, petroleum, sand, gravel or other extractive materials,

(d) the protection of areas of significance for nature conservation or of high scenic or recreational value, and places and buildings of archaeological or heritage significance, including Aboriginal relics and places,

(e) the cost of providing, extending and maintaining public amenities and services to the land, and

(f) future expansion of settlements in the locality.

(2) As well as the matters referred to in subclause (1), the Council shall take into consideration the relationship of the development to development on adjoining land and on other land in the locality, including the effects of potential aerial spray drift.

…

Under Clause 9 of the Narrabri LEP mining is permissible on lands zoned 1(a) with development consent as mining use is not listed as a prohibited use in the zoning table.

Zone Objectives

Under the Narrabri LEP the objectives for land zoned 1(a) (General Rural) are to promote the proper management and use of resources by:

(a) protecting, enhancing and conserving:

(i) agricultural land in a manner which sustains its efficient and effective agricultural production potential,

(ii) soil stability by controlling and locating development in accordance with soil capability,

(iii) forests of existing and potential commercial value for timber production,

(iv) valuable deposits of minerals, coal, petroleum and extractive materials by controlling the location of development for other purposes in order to ensure the efficient extraction of those deposits,

(v) trees and other vegetation in environmentally sensitive areas where the conservation of the vegetation is significant to scenic amenity or natural wildlife habitat or is likely to control land degradation,

(vi) water resources for use in the public interest,

(vii) areas of significance for nature conservation, including areas with rare plants, wetlands and significant habitats, and

(viii) places and buildings of archaeological or heritage significance, including the protection of Aboriginal relics and places,

(b) preventing the unjustified development of agricultural land for purposes other than agriculture,

(c) preventing residential development of prime crop and pasture land, except where it is ancillary to agriculture or another use permissible in the zone,

(d) facilitating farm adjustments,

(e) ensuring that any allotment created for an intensive agricultural pursuit is potentially capable of sustaining a range of such purposes or other agricultural purposes,

(f) minimising the cost to the community of:

(i) fragmented and isolated development of rural land, and

(ii) providing, extending and maintaining public amenities and services.

The Modification is considered to be generally consistent with these objectives in that it comprises a minor alteration to an approved coal mine that will extract coal and involves short term surface developments (e.g. ventilation and gas drainage infrastructure) and construction of coal washing infrastructure (i.e. the CHPP) that would assist to maximise the efficiency of coal extraction once suitable approvals are in place to operate the CHPP.

Special Provisions

Part 3 of the Narrabri LEP provides a number of miscellaneous provisions of which clauses 21 and 23 are potentially of some relevance to the Modification:

21 Height of buildings

A person shall not, without the consent of the Council, erect a building containing more than 2 storeys above ground level.

The CHPP would be greater than two storeys in height.

23 Land subject to bushfire hazards

The Council shall not grant consent to the subdivision of land or to the erection of a building on land which is, in the opinion of Council, subject to bushfire hazards by reason of the vegetation on the land or on any adjacent land unless, in the opinion of the Council:

(a) adequate provision is made for access of fire fighting vehicles,

(b) adequate safeguards are adopted in the form of fire breaks, reserves and fire radiation zones, and

(c) adequate water supplies are available for fire fighting purposes.

ML 1609 is located in a rural environment within proximity to Jacks Creek and Pilliga East State Forest. The approved Stage 1 NCM incorporates a range of fire management or mitigation measures including the implementation of a Spontaneous Combustion Management Plan, Rehabilitation Plan (incorporating bushfire management measures) and NCOPL has also made monetary contributions to the Narrabri Shire Council for the provision of bush fire services. Objectives and key performance indicators for fire management are provided in the NCM Environmental Management System.

State Environmental Planning Policy (Major Development) 2005 (Major Development SEPP)

The approved stage 1 NCM was determined to be a project that meets the description in Schedule 1, Group 2, Clause 5(1)(a) of the Major Development SEPP and hence was assessed and approved under Part 3A of the EP&A Act.

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries), 2007

The Mining SEPP, which commenced on 16 February 2007, regularises the various environmental planning instruments that previously controlled mining activities.

Clause 5(3) of the Mining SEPP gives it primacy where there is an inconsistency between the provisions of the Mining SEPP and the provisions of any other environmental planning instrument (except the Major Projects SEPP, *State Environmental Planning Policy No. 14 [Coastal Wetlands]* [SEPP No. 14] and *State Environmental Planning Policy No. 26 [Littoral Rainforest]* [SEPP No. 26]).

- ***Clause 2***

Clause 2 sets out the aims of this SEPP (the Mining SEPP) as follows:

(a) to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and

(b) to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources, and

(c) to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources.

- ***Clause 12***

Clause 12 of the Mining SEPP requires that, before determining an application for consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must:

(a) consider:

(i) the existing uses and approved uses of land in the vicinity of the development, and

(ii) whether or not the development is likely to have a significant impact on the uses that, in the opinion of the consent authority having regard to land use trends, are likely to be the preferred uses of land in the vicinity of the development, and

(iii) any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses, and

(b) evaluate and compare the respective public benefits of the development and the land uses referred to in paragraph (a) (i) and (ii), and

(c) evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a) (iii).

The modified NCM is surrounded by land zoned 1(A) (General Rural Zone) and the modified NCM would be generally consistent with this use.

Noise and blasting, construction dust generation, transport and socio-economic impact assessments have been conducted for the modified NCM and these assessments indicate that the modified NCM would not result in significant additional impacts on adjoining landuses near the approved NCM (Sections 4.3, 4.4, 4.11, and 4.12).

As described in Sections 4.8 to 4.9, the modified NCM would not have a significant impact on regional water users, or nature conservation, and is not incompatible with the existing landuses within the vicinity of the approved NCM. As described in Section 4.12, the Modification would result in continued employment and business opportunities in the Narrabri LGA and adjoining Gunnedah LGA.

As described in Section 4, NCOPL would, where practicable, continue to implement a range of measures to avoid or minimise incompatibility with existing and future landuses in the vicinity of the modified NCM.

- ***Clause 14***

Clause 14, subclause (1) of the Mining SEPP requires that, before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure the following:

(a) that impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimised to the greatest extent practicable,

(b) that impacts on threatened species and biodiversity, are avoided, or are minimised to the greatest extent practicable,

(c) that greenhouse gas emissions are minimised to the greatest extent practicable.

In addition, clause 14, subclause (2) requires that, without limiting clause 14, subclause (1), in determining a development application for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider an assessment of the greenhouse gas emissions (including downstream emissions) of the development, and must do so having regard to any applicable State or national policies, programmes or guidelines concerning greenhouse gas emissions.

The potential impacts of the Modification on groundwater resources and surface water are discussed in Section 4.8, including measures to minimise potential impacts. The potential impacts of the Modification on threatened species and biodiversity are discussed in Section 4.9, including measures to minimise potential impacts.

The greenhouse gas emissions assessment for the modified NCM is provided in Section 4.5, including greenhouse gas abatement measures.

- ***Clause 15***

Clause 15 of the Mining SEPP requires that:

(1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider the efficiency or otherwise of the development in terms of resource recovery.

(2) Before granting consent for the development, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at optimising the efficiency of resource recovery and the reuse or recycling of material.

(3) The consent authority may refuse to grant consent to development if it is not satisfied that the development will be carried out in such a way as to optimise the efficiency of recovery of minerals, petroleum or extractive materials and to minimise the creation of waste in association with the extraction, recovery or processing of minerals, petroleum or extractive materials.

A review of potential coal production indicated that the changes proposed by the Modification would ultimately result in more efficient coal recovery. The Modification infrastructure components would integrate with the approved NCM infrastructure components and facilities as much as practicable, to minimise the required total surface disturbance area for the modified NCM. It is in NCOPL's financial interest to maximise the efficiency of coal recovery and minimise the production of waste which requires on-site disposal.

- ***Clause 16***

Clause 16 (1) of the Mining SEPP requires that, before granting consent for development for the purposes of mining or extractive industry that involves the transport of materials, the consent authority must consider whether or not the consent should be issued subject to conditions that do any one or more of the following:

(a) require that some or all of the transport of materials in connection with the development is not to be by public road,

(b) limit or preclude truck movements, in connection with the development, that occur on roads in residential areas or on roads near to schools,

(c) require the preparation and implementation, in relation to the development, of a code of conduct relating to the transport of materials on public roads.

Existing arrangements covering the transport of materials are set out in the Stage 1 EA. NCOPL has constructed a sealed 8 m wide access road that intersects the Kurrajong Creek Road (a public road) which provides access over the North Western Branch Railway Line and intersects the Kamilaroi Highway (also a public road) to the south-east of the pit top infrastructure.

Section 4.11 provides a review of potential transport impacts associated with the Modification.

Clause 16 (2) of the Mining SEPP requires that, if the consent authority considers that the development involves the transport of materials on a public road, the consent authority must, within seven days after receiving the development application, provide a copy of the application to each roads authority for the road, and the RTA (if the RTA is not a roads authority for the road).

In addition, Clause 16 (3) of the Mining SEPP requires that the consent authority:

(a) must not determine the application until it has taken into consideration any submissions that it receives in response from any roads authority or the Roads and Traffic Authority within 21 days after they were provided with a copy of the application,

…

NCOPL will continue to consult with the RTA as and when required in regard to traffic and road transport.

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development (SEPP 33)

Clause 13 of SEPP 33 requires the consent authority, in considering a Development Application for a potentially hazardous or a potentially offensive industry, to take into account:

(c) in the case of development for the purpose of a potentially hazardous industry—a preliminary hazard analysis prepared by or on behalf of the applicant, and

(d) any feasible alternatives to the carrying out of the development and the reasons for choosing the development the subject of the application (including any feasible alternatives for the location of the development and the reasons for choosing the location the subject of the application)…

The NCM operates in accordance with the environmental management plans and management procedures required by the Project Approval. These plans and procedures have been developed to minimise the environmental risks associated with operation of the mine.

The Modification does not significantly alter the consequences or likelihood of a hazardous event occurring at the NCM, as the operational activities on-site would be generally unchanged.

State Environmental Planning Policy No. 44 (Koala Habitat Protection) (SEPP 44)

SEPP 44 requires the consent authority for any Development Application in certain LGAs (including the Narrabri LGA) to consider whether land subject to a Development Application is *potential Koala habitat* or *core Koala habitat*.

A single Koala scat was identified during the site survey undertaken for the Stage 2 EA by Ecotone Ecological Consultants Pty Ltd (2009), however, no further evidence of a resident Koala population was identified. In addition, the only food tree species (*Eucalyptus albens*) listed in SEPP 44 was found at densities of less than 15% within the woodland areas within ML1609. Ecotone Ecological Consultants Pty Ltd (2009) concluded that even in the event of a resident population being identified, the loss of some woodland areas during clearing activities for Stage 2 of the NCM would be unlikely to affect the lifecycle of the Koala. Given that the proposed disturbance area for the Modification is a small subset of that proposed for Stage 2 of the NCM, it is considered unlikely that the Modification would affect the lifecycle of the Koala.

State Environmental Planning Policy No. 55 (Remediation of Land) (SEPP 55)

SEPP 55 aims to provide a State-wide planning approach to the remediation of contaminated land. Under SEPP 55, planning authorities are required to consider the potential for contamination to adversely affect the suitability of the site for its proposed use.

A consent authority must consider the following under clause 7(1):

(a) whether the land is contaminated, and

(b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and

(c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

Further under clause 7(2), before determining an application for consent to carry out development that would involve a change of use of land, the consent authority must consider a report specifying the findings of a preliminary investigation of the land concerned carried out in accordance with the contaminated land planning guidelines.

The Modification would be located within the existing ML 1609. As a result no change of use is proposed and no preliminary land contamination investigation is required.

Commonwealth Environment Protection and Biodiversity Conservation Act, 1999 (EPBC Act)

The objective of the EPBC Act is to provide for the protection of those aspects of the environment that are of "*national environmental significance".* Proposals that are likely to have a significant impact on a matter of environmental significance are defined as a *"controlled action"* under the EPBC Act. Proposals that are, or may be, a controlled action are required to be referred to the Commonwealth Minister for the Environment to determine whether or not the action is a controlled action.

Based on the assessments presented in Section 4.9, which include assessment of potential impacts on matters of national environmental significance under the EPBC Act, no matters of national environmental significance are likely to be significantly impacted by the modified NCM. It has therefore not been referred to the Commonwealth Minister for the Environment for consideration under the EPBC Act.

NSW Brigalow and Nandewar Community Conservation Area Act, 2005

The Pilliga East and Jacks Creek State Forests are included in Zone 4 under the *Brigalow and Nandewar Community Conservation Area Act, 2005*. These areas are outside of the extent of the Modification area.

Other Approvals

Additional approvals that may be required as a result of the Modification include:

- a variation to the Environmental Protection Licence (EPL) 12789 from the NSW Department of Environment, Climate Change and Water (DECCW); and/or
- an amendment to the existing Mining Operation Plan (MOP) from the NSW Department of Industry and Investment - Mineral Resources (DII-MR).

1.5 STRUCTURE OF THIS DOCUMENT

This EA is structured as follows:

Section 1	Describes the need for the Modification, an overview of the Modification, potentially applicable legislative and approval requirements, and a summary of the consultation undertaken.
Section 2	Provides a description of the approved Stage 1 NCM.
Section 3	Provides a description of the proposed Modification.
Section 4	Provides a review of the existing environment, assesses the proposed Modification and describes how NCOPL's environmental management systems and measures would be used to mitigate potential impacts.
Section 5	Provides a conclusion to this report.
Section 6	Lists documents and reports referenced in this document.

Where relevant, the assessment presented in this EA provides a summary of the recent environmental performance of the NCM.

1.6 CONSULTATION

NCOPL has discussed the modification with the DoP prior to, and during the development of this EA.

Consultation initiatives will continue throughout the EA assessment process and beyond, including:

- ongoing discussions with key regulatory authorities; and
- community consultation including the NCM Community Consultative Committee (CCC).

2 OVERVIEW OF THE NARRABRI COAL MINE

An overview of the approved Stage 1 NCM is presented below. A summary of the construction status of the approved NCM is provided in Section 1.2. Coal production at the approved Stage 1 NCM is scheduled to commence in January 2010.

2.1 MINING METHODS AND UNDERGROUND DEVELOPMENT

The approved NCM involves underground mining of the Hoskissons Coal Seam within ML 1609 using conventional continuous miner methods. The Stage 1 EA identified the lower 4.2 m (approximately) of the seam as the preferred working section for mining. The maximum approved annual mining rate is approximately 2.5 Mtpa.

Continuous miners will extract coal in a "room and pillar" arrangement whereby pillars are retained as roof support. The continuous miner will mine the coal in a series of rectangular tunnels and will load the coal directly onto a shuttle car from where it will be transferred to a breaker feeder and hence onto conveyors for removal from the mine.

The West Mains roadway (Area A) bisects the southern and northern areas within the indicative limit of underground workings (Figure 2). The continuous miner method will be used in Areas A, B and C (Figure 2) to progressively develop the north-south oriented panel roadways (in both areas B and C) and secondary partial extraction leaving stable pillars (Area B and potentially Area C) or to form coal blocks (to be extracted as part of Stage 2 operations).

2.2 CRUSHING AND STOCKPILING

Underground Crushing

Coal mined by the continuous miners will be broken through an underground breaker feeder to nominal <150 millimetres (mm) prior to transfer onto the conveyor belt system to the ROM surface stockpile area, via a conveyor drift and portal. Water sprays will be operated on the continuous miners and the breaker feeder to minimise dust creation underground.

ROM Coal Stockpiling

The ROM coal stockpile area covers an area of approximately 1.2 ha and has a stockpile capacity of approximately 150,000 t. Coal will be stockpiled up to 10 m in height. A dozer will be used for stockpile management.

Surface Coal Crushing/Sizing

Coal from the ROM stockpile will be pushed into the secondary breaker feeder and sized to 0 to 125 mm. The coal will then be conveyed through the tertiary sizer and processed to 0 to 50 mm product. The product coal will then be conveyed up the stacker conveyor and placed over product stockpile coal valves. The capacity of the system will be approximately 1,500 to 2,000 tonnes per hour (tph).

The crusher will be fitted with water sprays to suppress dust and will be fully enclosed to minimise noise emissions.

Product Coal Stockpiling

The product coal will be reclaimed and loaded into the rail load-out bin as required to meet train schedules. Surface conveyors will be partly enclosed to minimise dust emissions during periods of high winds. Water sprays will also be provided to control dust on coal stockpile areas and maintain moisture content of 6%.

2.3 TRANSPORT OF PRODUCT COAL

The operation and timing of trains along the North Western Branch Railway is governed by the Hunter Valley Coal Chain Logistics Team, and as such, the NCM requires 24 hour, 7 days a week train operation to provide the flexibility to operate within the train paths allocated to the haulage contractor (Pacific National).

At an maximum mining rate of 2.5 Mtpa and an initial train capacity of 3,100 t or 5,400 t, an average of two to three trains will be loaded and dispatched each day (note: the dispatch rate will vary to meet shipping arrival schedules at Port of Newcastle).

2.4 VENTILATION

The approved Stage 1 NCM ventilation system comprises the main ventilation drift and surface infrastructure (located within the box cut, below natural ground level). The ventilation surface infrastructure (which includes a fan house and outlet approximately 10 m in height) has been completed and is now operational. The ventilation fan is electrically powered and connected to the substation located adjacent to the surface buildings within the pit top area.

The overburden resulting from the excavation drift was used to construct a secondary containment bund within the rail loop and downstream of the evaporation/waste water (i.e. brine) storage ponds.

2.5 MINING EQUIPMENT

Surface Equipment (Construction)

Equipment to be used during surface construction activities is listed in Table 2. A number of light vehicles are used for personnel transport around the pit top area. Low loaders are used intermittently to deliver and retrieve large earthmoving equipment and construction materials.

Table 2
Surface Facilities Construction Equipment

Equipment Item	Typical Use
Crane (70 to 150 t)	Erection of structures
Excavator (100 to 120 t)	Drift box cut excavation
Bulldozer (e.g. Cat D9)	Water management structure construction
Articulated haul trucks (50 t)	Transport of excavated box cut material
Scraper (e.g. Cat 637)	Topsoil and subsoil stripping and stockpiling
Grader (e.g. Cat 14G to 16G)	General site preparation works, road maintenance
Sheepsfoot compactor (e.g. Cat 825)	Site access road construction
Portable compressor	Drift construction
Water cart	Dust suppression of construction areas
Gravel trucks (20 m^3 capacity)	Gravel cartage for site access and other roads
Generator (1 x 850 kVA + 1 x 70 kVA)	Initial power provision

m^3 = cubic metre.
kVA = kilovolt Ampere.

Surface Equipment (Operations)

The indicative surface equipment to be used during operations is listed in Table 3.

Table 3
Indicative Surface Operational Equipment

Equipment Item	Typical Use
Bulldozer (D9R)	Coal stockpile management
Electric ventilation fan (850 kW)	Ventilation of underground workings
Product Transport Trains	Product coal transportation to Port of Newcastle
Conveyors	Transport coal around stockpiling and processing areas
Double Roll Crusher	Coal Crushing

kW = kilowatt.

Underground Mining Equipment

The indicative underground mining equipment is listed in Table 4.

Table 4
Indicative Underground Operational Equipment

Equipment Item	Typical Use
Continuous miner	Underground primary and secondary mining
Shuttle cars	Transfer of coal from continuous miner to breaker feeder
Breaker Feeder	Breaking of coal
EIMCO (LHD)	Material transport
Man transport vehicle	Personnel transport
Roof bolting machine	Roof bolting
Panel conveyor belt	Transfer of coal from breaker feeder to transport drift conveyor

2.6 GAS DRAINAGE

The Stage 1 EA described the potential requirement to pre-drain gas where *in-situ* gas levels exceed prescribed limits.

The Stage 1 EA also described that additional specialist investigations will continue to review gas quantities in order to maintain safe gas levels across the potential mining areas. In addition, seam permeability will continue to be measured.

2.7 WATER SUPPLY AND MANAGEMENT

Water Supply

Water for the mining operations will be sourced from groundwater inflows into the underground mine and incidental rainfall that is collected within contained water storage areas. Water pumped from underground will be stored in the water storage and evaporation dams within the pit top area (Figure 2). Surface water flowing over disturbed areas of ML 1609 will be diverted to the storage dam in the south-eastern corner of the pit top area.

Water will primarily be used for dust suppression underground and in the coal handling areas and unsealed roads of the pit top area. The annual operational water demand of the approved NCM is approximately 120 ML. Approximately 85 ML of this annual requirement was proposed to be supplied from underground dewatering.

A RO plant is to be installed when observed dewatering volumes exceed operation requirements by a sufficient amount to sustain the operation of an RO plant. The RO plant will treat all underground and surface dust suppression requirements. Evaporation, treated water storage and brine ponds will store treated water and waste water from the RO plant.

Site Water Management

The objective of site water management at the Stage 1 NCM is to minimise potential impacts on surface and groundwater quality, surface water flows and groundwater hydrology. Site water management includes the following components:

- erosion and sediment control;
- management of surface water runoff;
- capture and storage of water for operational and environmental purposes; and
- storage and containment of saline water pumped from the underground workings.

2.8 WASTE MANAGEMENT

The Stage 1 NCM will generate the following waste streams:

- general domestic waste and recyclables associated with the NCM workforce and administration and workshop facilities;
- waste oils and grease; and
- sewage.

All general domestic waste and general recyclable products will be collected by an appropriately licensed contractor.

Waste oil and hydrocarbons will be removed from the NCM by an appropriately licensed contractor for recycling or disposal.

Sewage treatment facilities will include self-irrigating eco-cycle septic sewage system(s) approved by Narrabri Shire Council. The treated septic system water will be irrigated on landscaped areas within the pit top area. These facilities will be regularly serviced as required by Council and the manufacturer.

2.9 GENERAL SURFACE FACILITIES AND SUPPORTING INFRASTRUCTURE

General surface facilities include the site offices, switch rooms, workshop, compressor shed, wash bay, hardstand, fuel storage and re-fuelling facilities and septic system(s). Minor access tracks and electricity spur lines are also required to service infrastructure within ML 1609.

2.10 WORKFORCE

The Stage 1 EA described a construction workforce of up to approximately 80 people and an operational workforce of 94 to 113 people (dependent on the number of continuous miners in operation).

2.11 REHABILITATION

Rehabilitation objectives at the Stage 1 NCM are described in the Rehabilitation Management Plan (RMP) (NCOPL, in prep.) and include:

Short Term Objectives

- *To minimise clearing/vegetation disturbance consistent with operational requirements.*
- *To rehabilitate areas of disturbance no longer required for mining related operations in accordance with the approved RMP.*
- *To apply soil (topsoil/subsoil) to the final landform based on material availability and post-mining land use.*
- *To stabilise all earthworks, drainage lines and disturbed areas in order to minimise erosion and sedimentation.*
- *To control vermin, feral animals and noxious weeds.*

Long Term Objectives

- *To control vermin, feral animals and noxious weeds. Continuation and/or restoration of biodiversity and ecological integrity of areas affected by mining or agriculture within the mining lease.*
- *To establish a low maintenance, geo-technically stable landform commensurate with agricultural and nature conservation land uses.*
- *To blend the created landforms to appear as a natural extension with the surrounding landforms.*
- *To provide habitat for fauna and corridors for fauna movement within the final landform.*
- *To monitor rehabilitation success in terms of physical and biological parameters.*

Revegetation will be conducted in accordance with the RMP. Given the status of the approved Stage 1 NCM, rehabilitation works have not yet commenced.

2.12 ENVIRONMENTAL MANAGEMENT AND MONITORING

Environmental management at the NCM has included the development and implementation of a range of environmental management plans, procedures and environmental monitoring programmes, including:

- Interim Surface Water Management Plan (NCPL, 2008a).
- Noise Monitoring Program (NMP) (NCPL, 2007c).
- Blast Monitoring Program (BLMP) (NCPL, 2007d).
- Air Quality Monitoring Program (AQMP) (NCPL, 2007e).
- Aboriginal Cultural Heritage Management Plan (ACHMP) (NCPL, 2007f).

- Energy Savings Action Plan (NCPL, 2008b).
- Waste Management Plan (NCPL, 2007g).
- Environmental Management Strategy (NCPL, 2007h).
- Environmental Monitoring Program (NCOPL, 2009a).

NCPL has also prepared a Construction Phase or Interim Water Management Plan (IWMP) (NCPL, 2008c). The IWMP is currently being modified to account for the planned commencement of operations in January 2010. A Landscape Management Plan (LMP), incorporating a RMP, and a Mine Closure Plan and a Greenhouse Gas Minimisation Plan are also currently being prepared.

2.13 COMPLAINTS RECORD

NCOPL maintains a 24 hour, 7 days per week complaints phone line and complaints register at the NCM.

Since the commencement of construction in April 2008, a total of 11 complaints have been received and recorded by NCOPL (NCOPL, 2009b). The majority of complaints related to noise from construction and were received from one landholder (Section 4.3).

3 DESCRIPTION OF THE MODIFICATION

3.1 MINING METHODS AND UNDERGROUND DEVELOPMENT

No significant changes are proposed to the approved mining methods.

The Modification would include a change in the sequence of panel roadway development. Panel roadways would be developed in accordance with the Stage 2 longwall sequence shown on Figure 4.

3.2 MINING EQUIPMENT

The equipment to be used during surface construction of the approved NCM is listed in Table 2. The surface construction activities for the Modification would require mobile fleet items associated with construction of:

- West Mains ventilation shaft and surface infrastructure;
- rear of panel ventilation shaft and surface infrastructure;
- gas pre-drainage boreholes and surface infrastructure;
- CHPP; and
- access tracks.

Surface construction equipment for the Modification would operate during the following hours (7 days per week):

- Vegetation clearance/soil removal – 7.00 am to 6.00 pm.
- Surface infrastructure construction – 7.00 am to 10.00 pm.
- Shaft construction – 24 hours per day.

The Modification would not change the surface equipment to be used during operations (with the exception of a ventilation fan being constructed in a different location).

3.3 COAL HANDLING AND PREPARATION PLANT

The Modification would include the construction (but not operation) of a CHPP (required for Stage 2 of the NCM). The construction of the CHPP would not result in any changes to the approved coal crushing, sizing and stockpiling methods. The CHPP would be situated immediately south of the ROM coal stockpile, within the existing pit top area (Figure 4). The proposed CHPP area has been previously cleared as part of the approved Stage 1 NCM surface facilities area.

The CHPP would include a 435 tph coal washing circuit and a dewatering circuit. The CHPP components are shown diagrammatically on Figure 6.

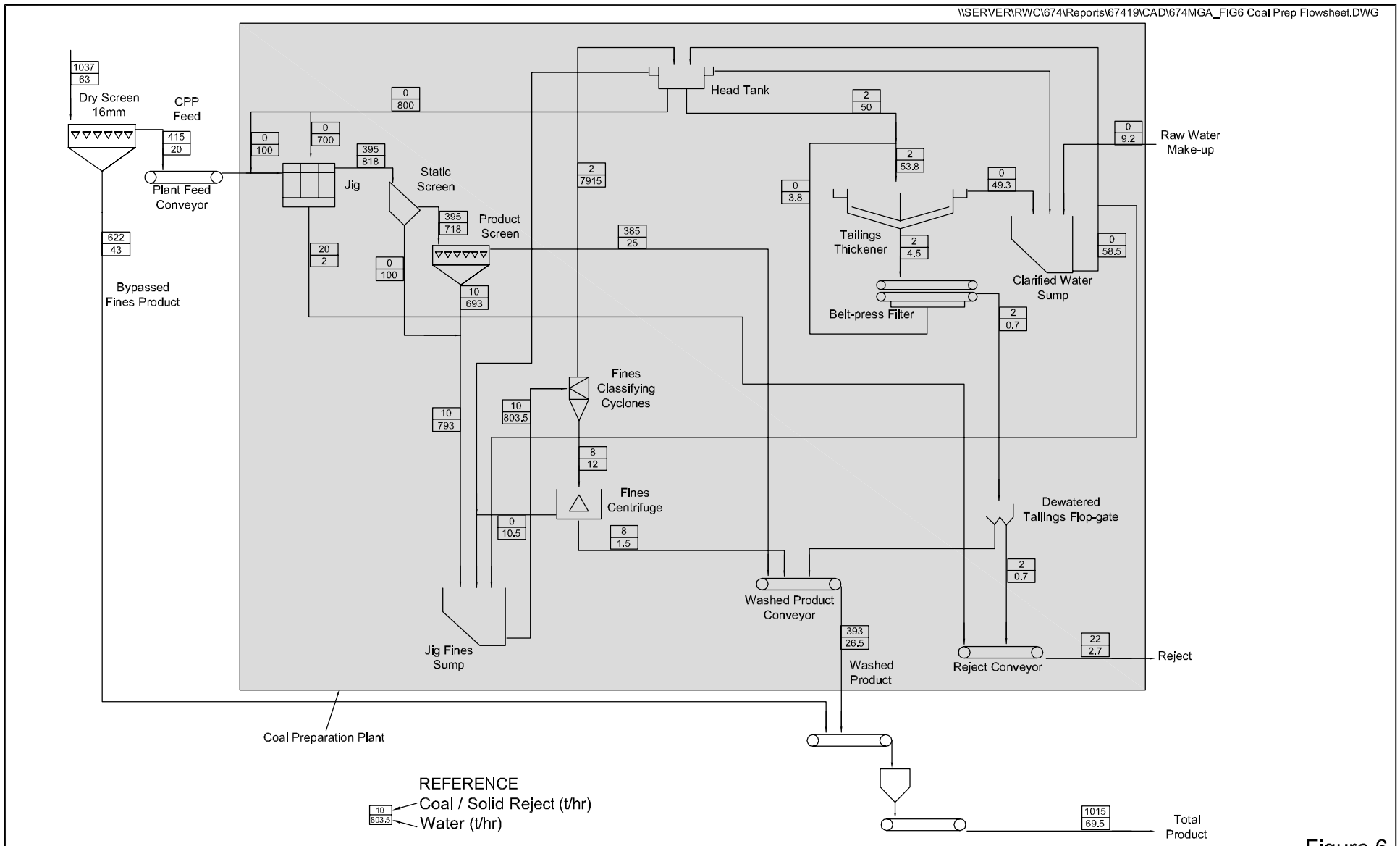


Figure 6

COAL HANDLING AND PREPARATION PLANT FLOWSHEET

3.4 VENTILATION

The Modification would include the construction and use of a ventilation shaft (the West Mains ventilation shaft) and associated surface infrastructure (i.e. exhaust) in the area above the West Mains roadway below Stage 2 Longwall 2 (Figure 4). A small diameter vertical ventilation shaft (i.e. rear of panel ventilation shaft) is also proposed (Figure 4).

Tests conducted by Geogas Pty Ltd for Stage 2 of the NCM established that while gas compositions within the Hoskissons Coal Seam vary considerably, the predominant gas is carbon dioxide (CO_2) (approximately 90%) with concentrations of methane (CH_4) and nitrogen (N_2) also present in varying proportions (NCOPL, 2009b). The results of gas desorption tests established the total desorbable gas content within the mine would vary from 3.87 cubic metres per tonne (m^3/t) to 7.03 m^3/t on a dry, ash free basis (NCOPL, 2009b). Considering these parameters, and based on the extraction of 4.2 m of coal from the seam of 9 m average thickness, gas emissions during Stage 2 development are expected to reach 1,200 litres per second (L/s) CO_2 in deeper horizons if high permeability persists at depth (NCOPL, 2009b).

NCOPL propose to ventilate the mine to maintain the general CO_2 concentration below 1.25%, in accordance with the requirements of the NSW *Coal Mine Health and Safety Act, 2002*.

Given the long lead time associated with installing ventilation infrastructure, it is proposed that West Mains ventilation shaft and associated rear of panel ventilation shaft be developed prior to Stage 2 longwall mining. The development of the West Mains ventilation shaft and associated rear of panel ventilation shaft would include:

- Initial ventilation from the pit bottom to the West Mains ventilation shaft by two axial fans located within the box cut, using one of the three drifts as a return airway.
- Development of the West Mains ventilation shaft, which would have an internal diameter of approximately 5.5 m and be developed as a blind bore from the West Mains ventilation shaft area (Figure 4). The West Mains ventilation shaft would be lined with concrete. Associated surface fans would be constructed at the surface within the West Mains ventilation shaft area. On commissioning of the fans, the fans in the box cut would be removed and the three approved drifts would become intake airways.
- Development of the rear of panel ventilation shaft with a diameter of approximately 2.1 m. The rear of panel ventilation shaft would be steel lined (grouted into place).

The construction area for the West Mains ventilation shaft area would be approximately 5 ha and incorporate the following:

- earthworks, roads;
- drill rig foundation and shaft drilling zone;
- general equipment laydown area;
- casing laydown area;
- stores and container area;
- parking area;
- generator, compressor and fuel storage area;
- spoils handling area;
- water and drill spoil settlement pond(s); and
- sediment dam.

The indicative layout of the ventilation shaft area and components is shown on Figure 7.

The rear of panel ventilation shaft area would up to approximately 0.25 ha.

The West Mains ventilation shaft and rear of panel ventilation shaft areas would be located within previously cleared areas (i.e. they would avoid remnant vegetation).

3.5 GAS PRE-DRAINAGE

The Modification would include the development and operation of gas (and potentially water) pre-drainage infrastructure, involving drilling from the surface into and along the coal seam, generally within the area of Stage 2 Longwalls 1 to 3.

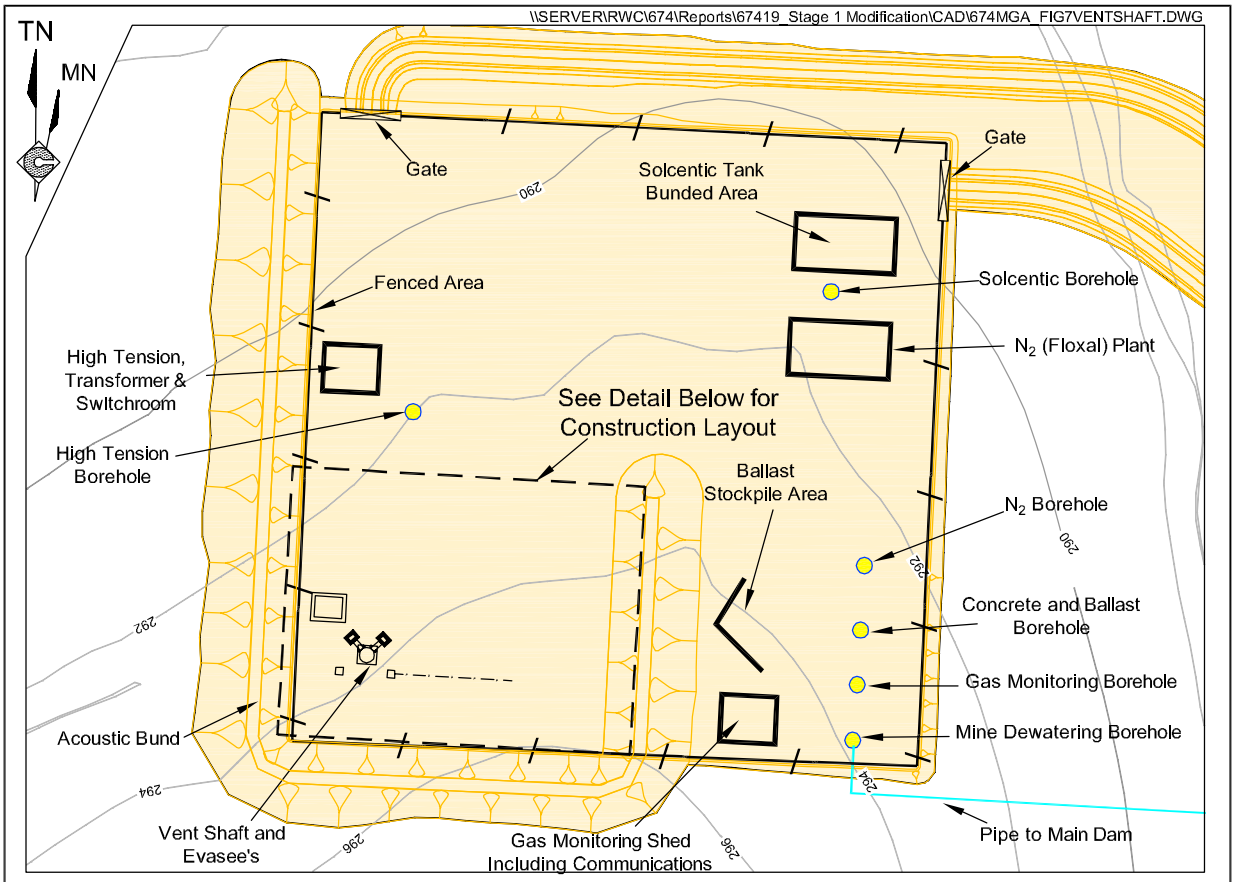
Surface to in-seam pre-drainage is currently being trialed at NCM, and subject to the results of this trial would be used preferentially over conventional underground pre-drainage methods. Surface to in-seam pre-drainage would allow commencement of pre-drainage well in advance of Stage 2 mining, in order to minimise the potential for Stage 2 works to be held up by underground pre-drainage requirements.

Surface to in-seam pre-drainage using MRD involves drilling from surface into and along the coal seam. The gas (as well as water) is then drawn from the seam using a vacuum pump and either dispersed to the atmosphere or collected for power generation or flaring. Due to the very low methane concentration within the gas, power generation or flaring of the gas is not feasible and so the predominantly CO_2 gas would be dispersed. The water pumped to the surface would be piped to the pit top area for storage in one of the water storage/evaporation ponds. Surface to in-seam pre-drainage provides a significant advantage over conventional in-seam pre-drainage in low desorption underground environments as the coal can be drained well in advance of mining. Conventional in-seam pre-drainage requires the development of gate road headings of a particular panel prior to the commencement of pre-drainage.

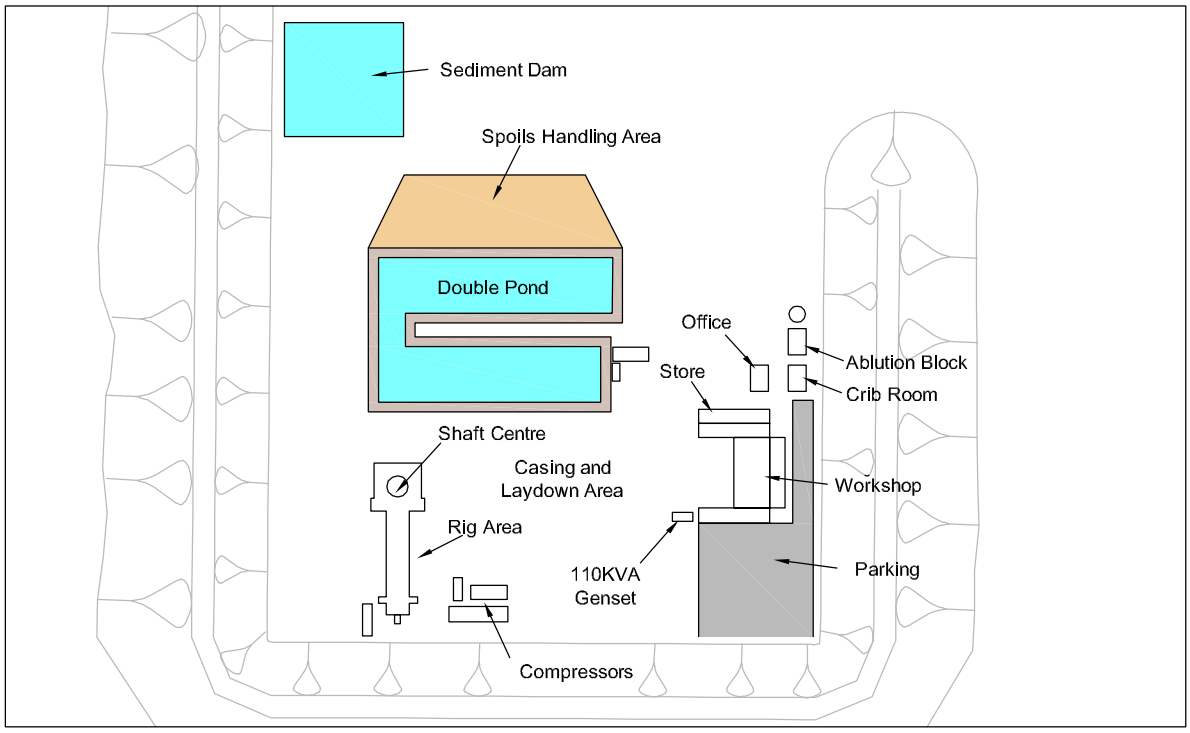
Surface to in-seam pre-drainage requires a number of small diameter boreholes to be drilled into and then along the length of the coal seam. The boreholes would be drilled from surface to the gate road development for Stage 2 Longwalls 1 to 3 (Figure 4). Once drilled into the Hoskissons Coal Seam, the boreholes would be split into two or three small diameter lines to increase the capacity for gas desorption into the boreholes and therefore drainage from the seam. Figure 8 shows the surface disturbance associated with each surface to in-seam borehole drill site. An area of approximately 80 by 80 m would be required for each borehole drill site (0.64 ha). The surface to in-seam pre-drainage sites along the development for Stage 2 Longwalls 1 to 3 would be located within previously cleared areas where practicable.

At the exit of each set of surface to in-seam boreholes, a pump well would be constructed to intersect each borehole. A pump at the top of each well would be used to extract the gas and water accumulating in the boreholes. Figure 8 shows the general arrangement of these gas production sites, as well as the general surface disturbance associated with each site. The current pre-drainage arrangement provides for three pump wells at each gas production site, requiring an area of approximately 0.64 ha. The total area of disturbance associated with surface to in-seam boreholes and gas production sites is estimated at up to approximately 9 ha. The gas production sites would be located within previously cleared areas where practicable.

The total area of disturbance for the access tracks to service the surface to in-seam boreholes and gas production sites is estimated to be approximately 9.5 ha. The access tracks would be predominantly located within previously cleared areas. The Modification would also use part of an existing cleared all-weather unsealed access road (Greylands Road) in the north of ML 1609 to service the gas pre-drainage infrastructure as required.



VENTILATION SHAFT AREA (OPERATION)



VENTILATION SHAFT AREA (CONSTRUCTION)

SCALE 1:3 000

50 0 50 100 150m

Figure 7
VENTILATION SHAFT
INDICATIVE LAYOUT

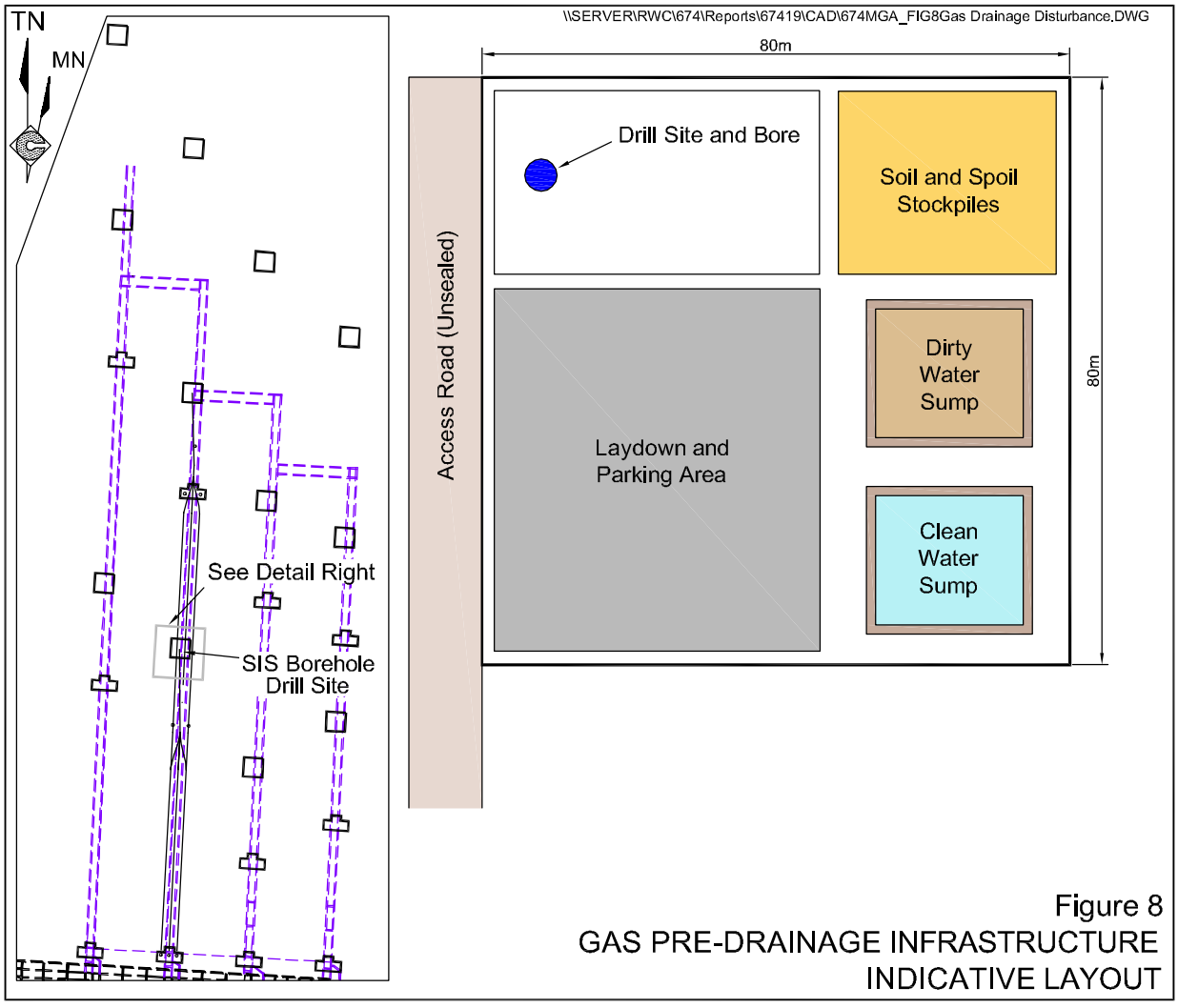


Figure 8
GAS PRE-DRAINAGE INFRASTRUCTURE
INDICATIVE LAYOUT

3.6 WORKFORCE

The Modification would involve a workforce of approximately 35 people on average, over the 12 month construction period. Approximately 25 people would be required to construct the CHPP, approximately five people would be required to construct the West Mains ventilation shaft and up to 7 people (5 people on average) would be required to install the gas pre-drainage infrastructure. The Modification workforce would be in addition to the approved Stage 1 NCM operational workforce of 94 to 113 people (dependent on the number of continuous miners in operation).

4 ENVIRONMENTAL ASSESSMENT

4.1 CLIMATE

The Narrabri area is situated between the tropical and temperate climatic zones (i.e. between the belts of the sub-tropical highs and the zone of mid-latitude westerlies). In summer, synoptic highs dominate the climate. Low pressure systems pass at regular intervals bringing milder temperatures and winds from the southerly quadrant. The climate is also influenced by substantial mountain ranges located to the east and south, and to a lesser extent to the west.

A summary of the key characteristics of the climate in the Narrabri area is provided below (NCOPL, 2009b).

- Seasonal temperature fluctuations are typical for the region with the average maximum daily temperatures being recorded in the summer months of December, January and February (33 to 33.8 degrees Celsius [^{o}C]) and the average lowest daily temperatures being recorded in the winter months of June, July and August (17.7 to 19.3^{o}C).
- The average annual rainfall at the NCM is estimated at 599 mm with the median annual rainfall calculated at 562 mm. The annual rainfall at the NCM can vary considerably from year to year. Based on the 119 years of records, the 10% and 90% annual rainfalls are estimated at 397 mm and 839 mm, respectively.
- The average monthly rainfalls at the NCM vary during the year from a low of 34.5 mm in April to a high of 78.8 mm in January. The summer average month rainfalls (50.1 to 78.8 mm) are generally higher than the equivalent winter monthly rainfalls (34.5 to 46.1 mm).
- The average annual potential evaporation at the NCM is estimated at 1,504 mm. Evaporation varies seasonally, with high evaporation rates occurring between October and March. The potential evaporation rate during the summer months is greater (approximately 2.5 times) than the evaporation rate during the winter months.
- The average potential evaporation exceeds average rainfall for all months of the year. The annual deficit between mean rainfall and evaporation levels is 905 mm.
- The average relative humidity recorded at 9:00 am varies between 57% and 84% throughout the year. The relative humidity is highest during the winter months and lowest during the summer months.
- The wind speed follows similar seasonal patterns to temperature with the highest values recorded in the summer months and the lowest values recorded in the winter months.

Annual wind rose indicate that NCM would tend to experience light to fresh winds (average wind speed of between 1.5 metres per second [m/s] and 10.5 m/s) from the east-southeast to south-southwest (approximately 38% combined) and from the west to the north-west (approximately 22% combined). Seasonal variations include the following (NCOPL, 2009b):

- spring - light to fresh winds are experienced predominantly from the east-southeast to south-southeast (approximately 36% combined) and west to north-west (approximately 29% combined);
- summer - light to fresh winds are experienced predominantly from the east-southeast to south-southeast (approximately 42% combined);
- autumn - light to fresh winds are experienced predominantly from the east-southeast to south-southeast (approximately 40% combined); and

- winter - light to moderate winds (between 1.5 m/s and 8 m/s) are experienced from the east-southeast to south (approximately 43% combined) and light to fresh winds from the south-west to north-west (approximately 34% combined).

4.2 LAND RESOURCES

4.2.1 Landuse

The landuse on the adjoining properties to the north, south and east of the NCM is agricultural and primarily involves grazing and cereal cropping.

The Modification area is predominantly cleared for grazing (cattle, sheep and horses) with some cereal crops grown, particularly wheat. Small patches of remnant native vegetation remain within the agricultural areas, along creeks, Crown roads or as isolated areas. To the west, the land is predominantly forested with woodlands dominated by cypress pine and box gum trees. The Pilliga East State Forest is located to the south-west.

The eastern edge of the Stage 1 NCM area lies adjacent to the Kamilaroi Highway and the North Western Branch Railway Line. Beyond the transport corridor to the east, the land is used predominantly for cropping given most of the land lies within the Namoi River Floodplain. A small quarry is present on the “Bow Hills” property approximately 350 m east of the Kamilaroi Highway.

The surface disturbance associated with the Modification would result in a change in the landuse of these areas during the life of the NCM (i.e. they would not be available for agricultural use while mining activities are occurring). However, it is expected that following mine closure and rehabilitation the site would be returned to agricultural use, with some areas rehabilitated to native woodland communities comparable to the pre-mining situation. Disturbance areas associated with access tracks, gas pre-drainage infrastructure and rear of panel ventilation shafts would be progressively rehabilitated when they are no longer required.

4.2.2 Soils

The Narrabri Soil Conservation Service Technical Manual (Anon., 1978) depicts ML 1609 located on the boundary of Red Brown Earth soils and the Pilliga Scrub soils.

Red Brown Earth soils are generally associated with gently undulating slopes. The soils are typically hardsetting with a sandy loam to sandy clay loam A horizon overlying a sandy clay loam to light clay B horizon. The soils are predominantly red brown in colour and have a weak to moderate degree of structure.

The Pilliga Scrub soils are mainly sandy solodised soils and sandy solodic soils. The soils possess a surface horizon of light texture that is sharply differentiated from the subsoil, which has a well developed columnar structure with a sandy texture. There is usually a strongly bleached zone above the subsoil. Other soils within this complex include sandy solodised and solodic soils, deep siliceous sands, earthy sands, lithosols and red and yellow earths.

Management measures that would be implemented by NCOPL to minimise the potential impacts of the Modification on soil resources are listed below.

- All soils would be handled as little as possible by clearly identifying the area to be stripped and the area of stockpiling.
- Soils would not be stripped or replaced during wet conditions where practicable.

- Driving of machinery on the topsoil and subsoil stockpiles would be prohibited once the stockpiles are created, to minimise compaction and further degradation of soil structure.
- Topsoil stockpiles would not exceed 2 m in height, and subsoil stockpiles would not exceed 3 m in height.
- Upslope water diversion banks and perimeter amenity bunds would be used to direct overland surface water flow away from soil stockpiles.
- Downslope sedimentation controls would be implemented as required, and until such time as the surface of the soil stockpiles is appropriately stabilised using groundcover species.
- The formed soil stockpile surfaces would have a generally uneven surface that is as 'rough' as possible, in a micro-sense, to assist in runoff control and seed retention and germination.
- Soil stockpiles would be sown with stabilising groundcover species as soon as possible after placement and watered if necessary to speed up establishment. The vegetation would help stabilise the surface and minimise erosion and sedimentation.
- Stabilisation measures would be taken to minimise loss of soil materials from the stockpiles prior to the establishment of stabilising ground cover. Stabilisation measures would include the use geotextile “silt fences” or lines of straw bales.

4.2.3 Landforms

The NCM lies within the Namoi River Valley in an area representative of the transition from the open plains to the west in the Walgett and Coonamble areas and the more elevated and dissected country to the north-east (the Nandewar Ranges) and further south associated with the Warrumbungle and Liverpool Ranges (both which are part of the Great Dividing Range). The local topography is generally flat to undulating, with elevations typically up to 400 m Australian Height Datum (AHD) in the west in Jacks Creek State Forest and decreasing to approximately 230 m AHD in the east toward the Namoi River.

Within ML 1609 itself, the topography varies from areas that are comparatively flat in the east with low, gentle and undulating topography towards the west. Elevations range from 370 m AHD in the west to 240 m AHD in the east. Slopes across ML 1609 average 3^{o} with two low ridges oriented parallel and north-east to south-west across ML 1609. The maximum slopes of approximately 18^{o} occur in the south-west of ML 1609 whilst the minimum slopes of $<1^{o}$ are common in the north-east.

Since commencement of site establishment activities associated with the approved NCM (Stage 1), the topography of the pit top area within ML 1609 has been modified, most noticeably by:

- the excavation of the box cut for entry to the underground mine;
- the construction of a 5 m high bund wall around the southern and western perimeter of the surface facilities;
- cut and fill earthworks associated with the construction of the NCM rail loop and various hardstand surfaces; and
- various soil stockpiles.

The proposed installation of the ventilation shaft, gas drainage activities and construction of the CHPP would involve limited cut and fill earthworks and would not significantly impact the landforms of the local area.

4.2.4 Visual Aspects

Various views of the Stage 1 NCM pit top area are currently possible from the following non-project related residences or parts of these properties: “Naroo”; “Ardmona”; “Kurrajong”; “Bow Hills”; “Pineview”; “Greylands”; and “Oakleigh”.

Views of the ventilation shaft areas and gas drainage activities would also be possible from the following additional non-project related residences or properties: “Newhaven”; “Haylin View”; “Matilda”; and “Bungaree”.

The ventilation shaft area has been selected as it is already shielded from residences to the south and south-east by topography and existing vegetation. The construction of the perimeter bund around the shaft itself would further reduce views of this area.

Gas drainage activities would be temporary in nature, and similar visually to the exploration drilling activities which has been ongoing over ML 1609 for a number of years. Beyond a distance of a few hundred metres, the activities would be virtually imperceptible. Dust suppression activities would be undertaken to reduce dust generation, likely to be the most noticeable aspect of these operations. Once completed, the gas drainage sites would be rehabilitated.

4.3 NOISE AND BLASTING

Construction Noise

Applicable Stage 1 NCM noise limits are provided in Attachment 1.

Development of Stage 1 of the NCM involves a range of noise generating equipment and includes the following key construction activities:

- establishment of the pit top incorporating:
  - offices (completed);
  - workshops (completed);
  - amenities (completed);
  - coal crushing (currently under construction);
  - coal stockpiling (completed); and
  - train loading infrastructure (currently under construction);
- construction of an upgraded intersection between the Kamilaroi Highway and Kurrajong Creek Road (completed);
- construction of an upgraded rail crossing and site access road (completed);
- establishment of the box cut (completed);
- establishment of the transport drift, ventilation drift and a conveyor drift (currently under construction); and
- construction of four evaporation ponds for containment of groundwater dewatered from the mine (completed).

The NMP for the NCM (NCPL, 2007c) provides maximum sound power levels for the following key construction noise sources (Table 5).

Table 5
Construction Noise Sources – Maximum Sound Power Levels

Key Construction Noise Sources	Sound Power Level (L_{A10})
Building fabrication at surface facilities	110 dB
Tracked dozer (Clearing/tree felling)	117 dB
Front-end Loader	117 dB
Topsoil scraper	118 dB
Overburden Truck	116 dB
Grader	114 dB
Pneumatic roller	114 dB

After: NCPL (2007c).
dB = decibel.

Nine complaints have been received since the commencement of the Stage 1 NCM construction activities in relation to noise levels from the landholder at the "Kurrajong" property.

Noise monitoring conducted during construction of the NCM in May 2008 indicated compliance with applicable noise criteria (NCOPL, 2009b). Additional noise monitoring conducted in June 2008 identified a marginal (1 dB) exceedance of the noise criteria at "Westhaven" (company owned), a 3 dB exceedance at "Greylands" and a 13 dB exceedance at "Kurrajong" during temperature inversion conditions of up to 6º/100 m. However compliance with the nominated noise criteria was demonstrated when such strong inversion conditions did not occur (NCOPL, 2009b). Following the completion of earthworks in the pit top area, subsequent noise monitoring indicated compliance with applicable Project Approval noise criteria (NCOPL, 2009b).

The potential construction noise impacts resulting from the Modification would be largely the same as those identified in the Stage 1 EA. Potential noise sources would be associated with equipment required to construct:

- West Mains ventilation shaft and surface infrastructure;
- rear of panel ventilation shaft and surface infrastructure;
- gas pre-drainage boreholes and surface infrastructure;
- CHPP; and
- access tracks.

Surface construction works for the Modification are expected to take approximately 12 months and would be undertaken during the following hours (7 days per week):

- Vegetation clearance/soil removal – 7.00 am to 6.00 pm.
- Surface infrastructure construction – 7.00am to 10.00 pm.
- Shaft construction – 24 hours per day.

The ventilation shaft site is approximately 1.7 km from the nearest non-company owned residence and the CHPP construction site is approximately 1.9 km from the nearest non-company owned residence.

The noise assessment undertaken for the Stage 2 EA (*Narrabri Coal Mine Stage 2 Longwall Project Noise and Vibration Impact Assessment* - Spectrum Acoustics Pty Ltd, 2009) includes an assessment of the abovementioned construction activities, in addition to a range of other on-site components that are not included in this Modification, including: earthworks for a longwall unit assembly area, ROM coal pad extension, reject emplacement area and construction of a longwall unit. The noise assessment for the Stage 2 EA was undertaken with reference to:

- relevant sections of the *Environmental Noise Control Manual* (EPA, 1994) – construction-related noise;
- *NSW Industrial Noise Policy* (EPA, 2000) – operations-related noise; and
- *NSW Environmental Criteria for Road Traffic Noise* (ECRTN) (EPA, 1999) – traffic-related noise.

The Stage 2 EA noise assessment assumed that all construction activities would take place simultaneously, providing for a conservative assessment. The assessment also modelled construction noise sources with sound power levels which are the same as or less than those applicable to the approved NCM listed in Table 5.

The Stage 2 EA noise assessment indicated that with the implementation of proposed construction noise controls, no non-company owned residences were predicted to experience construction noise levels in excess of the construction noise criterion, even under extreme temperature inversions of 6°/100 m (NCOPL, 2009b).

The mitigation and management measures for surface construction noise at the approved NCM are described in the NMP and include:

- limiting sound power levels on earthmoving equipment to the levels presented in Table 5, prior to the equipment being brought onto site; and
- fitting earthmoving equipment with low/mid range frequency reversing alarms, prior to the equipment being brought onto site.

The above measures would be used for the Modification.

Regular noise monitoring would be undertaken in accordance with the NMP to monitor whether the NCM is complying with the applicable Project Approval and EPL noise criteria, and to enable NCOPL to implement additional management measures if necessary.

Operational Noise

The NMP for the NCM (NCPL, 2007c) provides maximum sound power levels for key operational noise sources (Table 6).

Table 6
Stage 1 Operational Noise Sources –Maximum Sound Power Levels

Operational Noise Source	Sound Power Level	
	(L_{Aeq})	(L_{Amax})
Conveyors	76 dB/m	80 dB/m
Dozer at stockpile	107 dB	114 dB
Crusher (attenuated)	104 dB	108 dB
Rail load-out	102 dB	114 dB
Workshop	95 dB	105 dB
Ventilation fans (attenuated)	102 dB	N/A
Personnel carrier	102 dB	115 dB
Locomotives idling on rail loop	102 dB	106 dB

After: NCPL (2007c).
dB/m = decibel per metre.

The Modification does not seek approval for operation of the CHPP as this would be approved via the Stage 2 EA.

As a component of the Modification, the new ventilation shaft and gas pre-drainage infrastructure would be operated to remove gas from the coal seam and maintain suitable ventilation air quality underground.

The gas pre-drainage infrastructure would not present a significant operational noise source.

It is not anticipated that the operation of the West Mains ventilation fan would significantly alter the noise emissions of the approved Stage 1 NCM. The noise assessment undertaken for the Stage 2 EA includes an assessment of the operation of the West Mains ventilation shaft, in addition to a range of other on-site components that are not included in this Modification. These include: operation of the CHPP, activities at the reject emplacement area and goaf gas drainage. The relevant scenario modelling for the Stage 2 EA noise assessment indicated that, even with the operation of the additional components that are not included in the Modification, exceedances of the applicable criterion are likely to be rare and would only occur under strong inversion conditions.

The mitigation and management measures for surface operations noise at the approved NCM are described in the NMP. The relevant measures described in the NMP would continue for the Modification.

Regular noise monitoring would continue to be undertaken in accordance with the NMP to verify continued compliance with applicable Project Approval and EPL noise criteria and to implement management measures if necessary.

Blasting

Applicable Stage 1 NCM blasting vibration and overpressure limits are described in Attachment 1.

Blasting at the NCM is undertaken in accordance with the BLMP. Surface blasts were conducted for the establishment of the box cut and rail loop as part of construction of Stage 1. These blasts were monitored and remained well within compliance parameters at the nearest receivers (NCOPL, 2009b).

Some limited blasting may be required during the establishment of the West Mains ventilation shaft where the shaft development works encounter more competent strata (e.g. the basalt sill). Any such blasting would use small maximum instantaneous charges. These blasts would be significantly smaller than blasting that has been undertaken to date.

Any blasts required for the West Mains ventilation shaft construction would be undertaken in accordance with the requirement of the BLMP and would be designed to meet applicable blast vibration and overpressure criteria at the nearest non-company owned residences.

4.4 CONSTRUCTION DUST GENERATION

Applicable Stage 1 NCM dust and particulate limits are described in Attachment 1.

Monitoring results from the eight dust gauges and two high volume samplers operated by NCOPL indicate general compliance with applicable dust and PM_{10} criteria (NCOPL, 2009b).

Dust management and monitoring at the NCM is currently undertaken in accordance with the AQMP.

Existing Stage 1 NCM dust management measures would be applied to the Modification construction activities and would include:

- minimising the extent of clearing required for construction activities;
- restriction of vehicles and equipment to clearly defined site roads/tracks;
- avoiding soil stripping during high winds;
- use of water carts on internal roads, hardstands and working areas; and
- progressive rehabilitation of areas of construction disturbance, as these areas become available.

With the implementation of these measures it is not anticipated that the construction of the ventilation shafts, CHPP and gas pre-drainage infrastructure would significantly alter the dust generation of the approved Stage 1 NCM.

It is noted that the air quality assessment completed for Stage 2 of the NCM (*Narrabri Coal Mine Stage 2 Longwall Project Air Quality Assessment* - Heggies Pty Ltd, 2009) indicated that with the implementation of proposed construction air quality controls, no residences were predicted to experience construction dust deposition or particulate concentration levels in excess of applicable air quality criteria (NCOPL, 2009b). The Stage 2 air quality assessment included evaluation of dust and particulate emissions generated by development of the CHPP, ventilation shafts, gas drainage and range of other on-site components that are not included in this Modification including earthworks for the longwall unit assembly area, ROM coal pad extension, reject emplacement area and construction of the longwall unit.

4.5 GREENHOUSE GAS GENERATION

NCOPL (2009b) estimates that the operation of Stage 2 of the NCM would on average generate some 0.35 million tonnes (Mt) of carbon dioxide equivalent emissions per annum from the emissions of methane and carbon dioxide from the coal seam. This estimate was generated based on production rates of up to 8 Mt of ROM coal per annum and the findings of exploration drilling results, which indicate that seam gas would consist of approximately 90% carbon dioxide and 10% methane (NCOPL, 2009b).

The gas pre-drainage infrastructure associated with the Modification would facilitate the pre-mining extraction of a portion of these seam gases (i.e. from within the coal seam associated with Longwalls 1 to 3 development roadways) to facilitate the safe and efficient initial development of the initial Stage 2 longwall mining operation.

NCOPL is committed to the implementation of the greenhouse gas abatement measures outlined in the approved Energy Savings Action Plan (NCPL, 2008b) for NCM Stage 1.

4.6 ABORIGINAL HERITAGE

An assessment of the cultural heritage of the NCM site was undertaken in March 2007 by Australian Archaeological Survey Consultants Pty Ltd for the Stage 1 EA. The assessment was undertaken in reference to the NSW Department of Environment and Conservation's (DEC's) *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DEC, 2005). The field survey was undertaken with the assistance of the Narrabri Local Aboriginal Land Council (Narrabri LALC).

Seven Aboriginal heritage sites were identified and these sites were managed in accordance with an ACHMP. The majority of the heritage sites identified by the Stage 1 survey are located in the vicinity of Kurrajong Creek Tributary 1, to the north of the rail loop.

There are no known Aboriginal heritage sites located at the CHPP construction site.

During the construction of Stage 1, soil stripping activities have been monitored by members of the Aboriginal community and no additional artefacts have been recorded to date (NCOPL, 2009b).

Further field surveys of the area in the vicinity of Panels 1 to 7 were conducted by Archaeological Surveys and Reports Pty Ltd (ASR) for Stage 2 of the NCM in 2009 with the assistance of site officers from the Narrabri LALC and the Narrabri Gomeroi Traditional Owner Group.

Some 43 sites were recorded within the Panel 1 to 7 survey area (ASR, 2009) which includes the area subject to the proposed ventilation shafts and gas drainage infrastructure associated with the Modification. Two Aboriginal heritage sites located near Panel 3 are considered to have higher scientific significance (ASR, 2009) (sites 38 and 39 shown on Figure 9). One site (10b) was specifically noted by the Aboriginal stakeholders as warranting protection and is located above Panel 5. A further Aboriginal site (19) was also recorded with higher artefact density and is located near the boundary of Panels 1 and 2 (Figure 9).

When constructing ventilation and pre-mining gas drainage infrastructure for longwalls 1 to 3, sites 19, 38 and 39 would be demarcated to avoid accidental damage. Disturbance to other known Aboriginal heritage sites located above Panels 1 to 3 would be avoided where practicable. In the event that avoidance of disturbance is not considered to be practicable, salvage of the artefacts would be undertaken in accordance with the protocols detailed in the ACHMP.

Site preparation and topsoil stripping activities for the Modification would be undertaken in accordance with the ACHMP. Cultural heritage site education would also be undertaken as a component of induction for staff and contractors who may come to site to work on the Modification in accordance with the ACHMP.

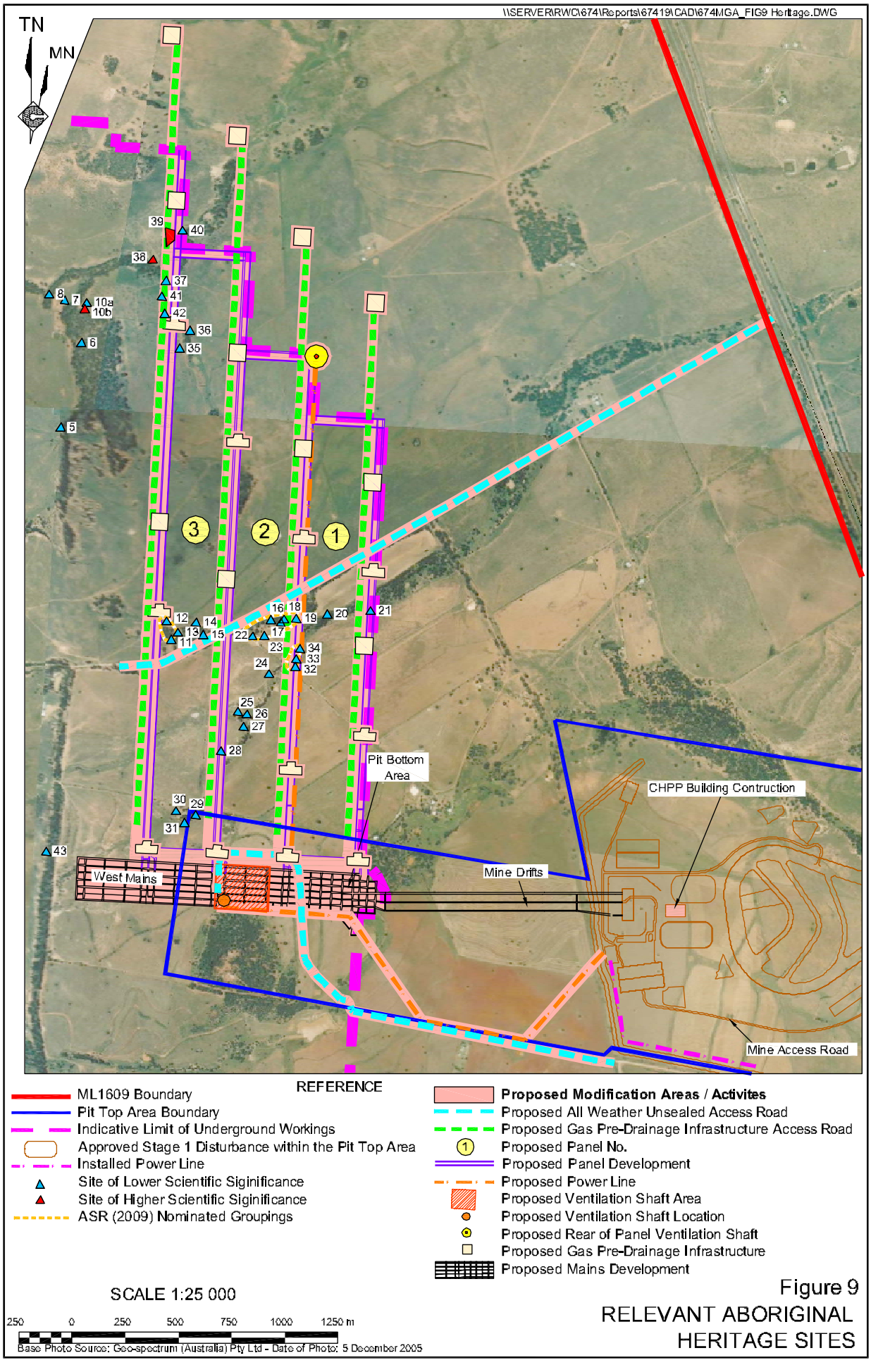


Figure 9

RELEVANT ABORIGINAL HERITAGE SITES

4.7 NON-ABORIGINAL HERITAGE

NCOPL completed a desktop search for Non-Aboriginal heritage listings within ML 1609 and surrounds. This desktop review indicated that the nearest registered non-Aboriginal heritage sites were located in Narrabri.

ASR also completed a field survey to record any structures, places or relics of non-Aboriginal heritage significance within ML 1609. The survey identified one item (a sawmill), located approximately 200 m to the east of the indicative limit of underground workings on the "Willarah" property, that was subject to further evaluation. However, ASR concluded that "*the Sawmill is assessed to be of no local historical interest, and of only low educational value, insufficient to warrant its classification as a structure of Heritage Significance*".

4.8 WATER RESOURCES

Surface Water

ML 1609 is located in the Namoi River catchment and within the catchments of its tributaries, namely Kurrajong Creek, Pine Creek and Tulla Mullen Creek. The Namoi River flows in a north-westerly direction approximately 3 to 5 km to the east of the eastern boundary of ML 1609.

The Namoi River catchment has been used extensively for agricultural activities for over 100 years and is one of Australia's most developed irrigation areas, supporting significant cotton and broadacre cropping (mainly sorghum, sunflower and wheat) as well as other crops, and some sheep and cattle grazing. There are a number of major storages in the Namoi River catchment, namely the Keepit, Chaffey and Split Rock Dams located on the Namoi, Peel and Manilla Rivers, to provide water for the licensed water users in the region.

ML 1609 is located within the catchments of Kurrajong and Pine Creeks. Pine Creek and its tributaries traverse the northern part of the site, before entering the Namoi River, while Kurrajong Creek and its tributaries originate in the south-western corner of ML 1609 and traverse the southern part of ML 1609, draining to Tulla Mullen Creek, which in turn drains into the Namoi River. The total catchments areas of Pine and Kurrajong Creeks are 76 km^2 and 62 km^2 respectively.

Pine and Kurrajong Creeks are ephemeral, generally flowing for short periods after significant rainfall events or protracted wet periods. Base flows in these creeks are insignificant. Sections of the local creeks are quite 'active' and are susceptible to high levels of erosion. The drainage paths of the smaller tributaries are poorly defined along some reaches through ML 1609.

Existing (pre-mining) surface water use within ML 1609 and in the local area is primarily stock watering. There is no large scale irrigation infrastructure on the site to suggest that crops on the site were ever irrigated from the existing dams. There are two small dams on Pine Creek downstream of ML 1609 from which water is used for stock watering.

Groundwater

Through a review of the available literature and mapping of the hydrogeological properties of the various formations below ML 1609, and site investigations which involved the construction and permeability testing of eight groundwater bores, GHD (2007) reported that the groundwater within ML 1609 is typically associated with fractures encountered in the consolidated sedimentary rocks and volcanics. In consolidated sandstones and shales, groundwater can occur both in the pore space in the rock matrix and within fractures and joints, whereas in the volcanics groundwater is generally only associated with fractures and joints. In the absence of fracturing, the inter-bedded and laminated nature of the Napperby and Purlawaugh Formations is likely to restrict vertical groundwater flow in these formations.

Shallow groundwater intersections at depths of 15 to 30 m below surface are associated with the weathered and fractured strata of the Garrawilla Volcanics. Between 35 and 75 m below surface, groundwater intersections within a confined to semi-confined fractured rock aquifer occur within the Purlawaugh, Napperby and Garrawilla Volcanics formations. Deeper groundwater intersections, typically associated with the fractures in the Basalt Sill and Napperby Formation, are encountered from 74 m to 144 m below surface. The pump testing of piezometers within the Hoskissons Coal Seam, Arkarula Formation and Pamboola Formation encountered groundwater, however, low permeability values and slow recharge rates suggest the three formations are unlikely to provide significant groundwater intersections.

Management of Potential Impacts

The locations of the existing and proposed water management control structures on the Stage 1 NCM pit top area include:

- A sediment basin (SB1) to collect dirty and contaminated runoff from the stockpiling and crushing/sizing area.
- A sump in the box cut to collect rainfall/runoff and seepage from the walls of the box cut.
- A series of sediment basins (SD1, SD2, SD3, SD4 and SD5) to collect and treat runoff from the southern part of the pit top area, disturbed during pit top area construction.
- A series of drains to collect runoff from the pit top area and divert it to the various water management dams.
- A series of ponds within the rail loop for the storage of dewatered groundwater (Dam A1), treated raffinate (Pond D) and waste brine (Ponds A2, A3, B and C).
- A water conditioning plant to treat dewatered groundwater to a sufficient quality for use at NCM (in underground, coal washing, etc.), increasing environmental flows in the Namoi River and potentially for use off site**.**

The following additional surface water controls are proposed as part of the Modification:

- The capacity of SB1 would be increased and an additional sediment basin (SB2) would be constructed immediately downstream of SB1 to provide additional capacity for the collection and storage of dirty runoff from the coal processing area.
- A new storage dam (SD6) would be constructed to collect potentially dirty runoff from the initial ventilation shaft area.

Surface water flows within each gas drainage or ventilation shaft area required for the Modification would be managed in accordance with a general Erosion and Sediment Control Plan (ESCP) (in accordance with the requirements of Landcom, 2004). The ESCP would provide for the following management:

- Prior to disturbance, the area would be marked out and 'no-go' zones identified.
- If located on or adjacent to a natural drainage line, a diversion bank would be constructed up-slope of the area to be disturbed and in accordance with Standard Drawing (SD) 6-4 of Landcom (2004).
- Based on the area to be disturbed, soil type and local topography, the requirement for a sediment basin would be determined, using the Revised Universal Soil Loss Equation.
- If a sediment basin is required, i.e. soil loss >200 tonnes per hectare per year (t/ha/year), the sediment basin design capacity would be calculated.
- Vegetation and soil would be cleared and stripped and stockpiled away from natural drainage lines for future use in rehabilitation of the site.
- Sediment fencing would be installed along the down-slope boundaries of the disturbed areas.
- The function of the sediment fencing (and diversion bank or sediment basin if constructed) would be regularly inspected and remedial works undertaken immediately if not performing at optimum capacity.

Runoff containing hydrocarbon contamination may be generated from:

- washdown area(s);
- workshop(s);
- fuel, oil and grease storages; and
- refuelling pads.

These areas would be managed as follows:

- Runoff would be drained to a triple interceptor (or similar) to reduce hydrocarbon concentration to acceptable levels before draining to SB1. The oily fraction would enter a containment system for removal as necessary.
- All oil, grease, fuel and hydrocarbon products would be securely stored on an impermeable surface within a bund capable of containing 110% of the largest tank's capacity.
- Refuelling, oiling and greasing would be restricted to designated areas, away from drainage and where spill kits are readily available.

In the event of a major hydrocarbon spill, the following actions would be undertaken:

- The contaminated soil at the site of the spill would be collected and transported to an approved waste depot or remediated safely at NCM.
- Pits would be constructed around the spill with sufficient hydraulic gradient to capture seepage water and contaminated material, enabling the pits to be pumped out.
- The local groundwater would be monitored for signs of further contamination.

4.9 FLORA AND FAUNA

4.9.1 Flora

The Stage 1 EA for the approved NCM assessed the short-term and long-term potential impacts of the approved NCM on flora. The type of potential flora impacts resulting from the Modification would be largely the same as those identified in the Stage 1 EA, the only difference being the proposed increase in the area to be cleared for the West Mains and rear of panel ventilation shaft areas, gas pre-drainage infrastructure areas and associated areas required for access tracks, pipelines and powerlines (i.e. approximately 34.6 ha).

The assessment presented below uses information from the vegetation survey and assessment undertaken in the ML 1609 area for the Stage 2 EA (*Narrabri Coal Mine Stage 2 Longwall Project Flora and Fauna Impact Assessment* - Ecotone Ecological Consultants Pty Ltd, 2009). The assessment of potential impacts to flora undertaken for the Stage 2 EA by Ecotone Ecological Consultants Pty Ltd (2009) was relevant to the much larger disturbance area of the Stage 2 EA, which includes the disturbance area of the Modification.

Vegetation Clearance

The Modification area covers approximately 34.6 ha of land. Remnant climax vegetation communities that would be cleared or modified include (Figure 10):

- approximately 0.9 ha of River She Oak/Belah/Inland Grey Box Forest (Riparian Forest) – across ML 1609 this community has been partially cleared, but remains a relatively intact open forest to woodland;
- approximately 1.7 ha of Inland Grey Box/Bimble Box/Blakely's Red Gum Woodland (Inland Grey Box Woodland) (equivalent to the Inland Grey Box Woodland in the Riverina, NSW Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions Endangered Ecological Community [EEC] [Inland Grey Box Woodland] listed under the NSW *Threatened Species Conservation Act, 1995* [TSC Act] which is assessed below) – across ML 1609 most areas of this community have been modified by agricultural activities with partial clearing of the shrub layer and at least occasional grazing of the groundcover; and
- approximately 0.6 ha of White Cypress Forest (Callitris Forest) - consisting almost entirely of tall white cypress in the tree layer with no shrub layer and a sparse, grazed ground layer, likely to have been artificially under scrubbed to provide pasture for grazing.

Approximately 31.4 ha of a cleared/semi-cleared or cultivated land (Cleared Open Grassland/Cropland/Weedy Areas/Cultivated Gardens) would also be cleared for the Modification. This community within the proposed disturbance area has been subject to nearly complete land clearing as a result of previous pastoral landuse and can be described as a human-made landscape created through extensive clearing and a range of agricultural practices (with grazing being the dominant practice).

Clearing native vegetation is a key threatening process listed under the TSC Act and the EPBC Act, however, the vegetation clearance required for the Modification is unlikely to significantly impact any vegetation communities, given:

- the relatively small areas of climax vegetation required to be cleared;
- all vegetation communities have been subject to partial or nearly complete land clearing; and
- the generally disjunct nature of the vegetation patches.

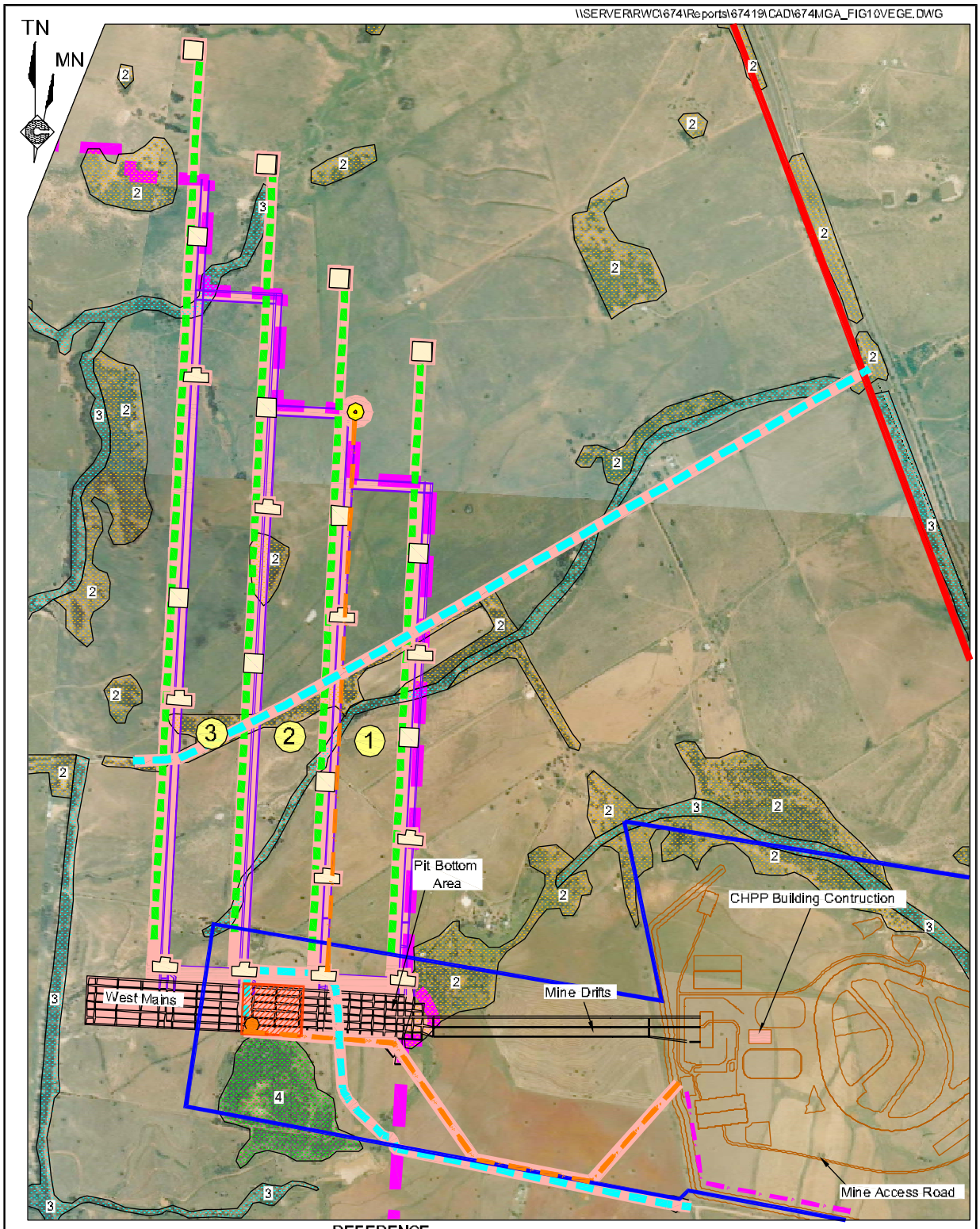


Figure 10
VEGETATION COMMUNITIES

Potential indirect effects of vegetation clearance include weed and pest proliferation, as discussed below.

Introduced Flora Species

Native vegetation disturbance can act as a catalyst for weed incursion and, if management initiatives are not implemented, proliferation of weeds can occur.

The potential weed incursion as a result of the Modification would be minimal, given the size of the area to be disturbed and the weed control measures outlined in the LMP (including the RMP), which would continue to be implemented.

Vegetation and Dust

Given that the Modification is not anticipated to significantly alter the dust generation of the approved Stage 1 NCM (Section 4.4), the Modification is unlikely to change the potential dust impacts on vegetation.

Threatened Flora Species and Ecological Communities

The assessment by Ecotone Ecological Consultants Pty Ltd (2009) considered the potential impacts of Stage 2 of the NCM on threatened flora species, populations and ecological communities, and their habitats in consideration of the DECCW's *Draft Guidelines for Threatened Species Assessment* (DEC, 2004).

Based on the findings of the recent survey and assessment conducted for the Stage 2 EA (which includes a much larger disturbance area than that proposed for the Modification), the disturbance area for the Modification:

- would be unlikely to significantly affect the lifecycle of a threatened flora species and/or population;
- would be unlikely to significantly affect the habitat of a threatened flora species, population or ecological community;
- would be unlikely to significantly affect the current disturbance regimes relevant to flora;
- would be unlikely to significantly affect habitat connectivity; and
- would not adversely affect critical habitat as no critical habitats are known to occur with the Modification area.

Matters of National Environmental Significance

The assessment by Ecotone Ecological Consultants Pty Ltd (2009) assessed the potential impacts of Stage 2 of the NCM on matters of national environmental significance (including threatened flora species and ecological communities listed under the EPBC Act) in consideration of the Commonwealth Department of the Environment, Water, Heritage and the Arts' (DEWHA) *EPBC Act Policy Statement 1.1 Significant Impact Guidelines Matters of National Environmental Significance* (Commonwealth Department of the Environment and Heritage [DEH], 2006).

Based on the findings of the recent survey and assessment conducted for the Stage 2 EA (which includes a much larger disturbance area than that proposed for the Modification) and a supplementary flora survey and assessment undertaken in September 2009 by FloraSearch (2009), no matters of national environmental significance relevant to flora are likely to be significantly impacted as a result of Modification.

Summary of Potential Impacts on Flora

Given the above and the measures included in relevant management plans, which would continue to be implemented for the NCM, the Modification is unlikely to result in a significant environmental impact on flora.

Mitigation and Management Measures

Potential impacts to flora are currently managed via implementation of measures included in the LMP (including the RMP) and the tree clearing protocol. These measures would continue to be implemented where relevant for the Modification.

In addition, the following measures would be implemented to minimise the potential impacts of the Modification on flora:

- A qualified ecologist would be commissioned to conduct a pre-clearance survey of proposed disturbance areas to identify whether any threatened species, populations or communities or their habitats are present. The pre-clearance survey would target threatened species known to occur or potentially occur in the area and would aim to identify habitat within the proposed clearance areas, particularly substantial habitat trees. All substantial habitat trees would be retained, wherever possible.
- In the event that an EEC or threatened species is identified, alternative locations or orientations of the disturbance area would be considered, if practicable.
- The location of access tracks would be determined in consultation with a qualified ecologist, following an inspection of each proposed route and determination of the path with the least potential impact on environmental values.
- Avoid disturbance to the vegetation of the Riparian Forest along watercourses, as far as practicable.

4.9.2 Fauna

The Stage 1 EA for the approved Stage 1 NCM assessed the short-term and long-term potential impacts of the approved NCM on fauna. The type of potential fauna impacts resulting from the proposed Modification would be largely the same as those identified in the Stage 1 EA, the difference due to the increase in the area proposed to be cleared for the West Mains and rear of panel ventilation shaft areas, surface to in-seam gas pre-drainage areas, gas production sites and associated areas required for access tracks, pipelines and powerlines (i.e. approximately 34.6 ha).

The assessment presented below uses information from the fauna survey and assessment undertaken in the ML 1609 area for the Stage 2 EA (*Narrabri Coal Mine Stage 2 Longwall Project Flora and Fauna Impact Assessment* - Ecotone Ecological Consultants Pty Ltd, 2009). The assessment of potential impacts to fauna undertaken for the Stage 2 EA by Ecotone Ecological Consultants Pty Ltd (2009) was relevant to the much larger disturbance area of the Stage 2 EA, which includes the disturbance area of the Modification.

Habitat Removal/Modification

Habitat removal and modification resulting from the Modification would involve the following key threatening processes listed under the TSC Act:

- Clearing of Native Vegetation;
- Removal of Dead Wood and Dead Trees;
- Bushrock Removal;
- Loss of Hollow-bearing Trees; and
- Alteration to the Natural Flow Regimes of Rivers and Streams and their Floodplains and Wetlands.

Clearing of Fauna Habitats

The Modification area covers approximately 34.6 ha of land. Broad fauna habitats that would be cleared or modified include (Figure 11):

- approximately 0.9 ha of Drainage Line habitat;
- approximately 2.3 ha of Woodland habitat; and
- approximately 31.4 ha of Cleared Open Grassland/Cropland/Weedy Areas/Cultivated Gardens.

Across ML 1609, the Drainage Line habitat has been partially cleared, but remains a relatively intact open forest to woodland.

Most areas of the Woodland habitat within ML 1609 have been modified by agricultural activities with partial clearing of the shrub layer and at least occasional grazing of the groundcover.

The Cleared Open Grassland/Cropland/Weedy Areas/Cultivated Gardens within the proposed disturbance area has been subject to nearly complete land clearing as a result of previous pastoral landuse and can be described as a human-made landscape created through extensive clearing and a range of agricultural practices (with grazing being the dominant practice).

Removal of Dead Wood and Dead Trees

Scattered dead trees (i.e. stag trees) and logs may occur within the 34.6 ha of land to be disturbed by the Modification. Although stag trees may be used by fauna (primarily birds and bats), the removal of these trees is likely to result in minimal environmental impact to any fauna species, given the size of the area to be disturbed and the strategies to minimise the impact of clearing activities on resident fauna, as outlined in the RMP and tree clearing protocol.

Loss of Hollow-bearing Trees

The removal of any hollow-bearing trees within the Modification area is likely to result in minimal environmental impact to any fauna species, given the size of the area to be disturbed is relatively small and generally disjunct from other areas of habitat in the surrounds and the strategies to minimise the impact of clearing activities on resident fauna, as outlined in the RMP and tree clearing protocol.

Fauna and Vehicular Traffic Movements

The Modification would result in some limited traffic generation during construction (Section 4.11). Therefore, the Modification is unlikely to increase the incidence of fauna mortality via vehicle strike.

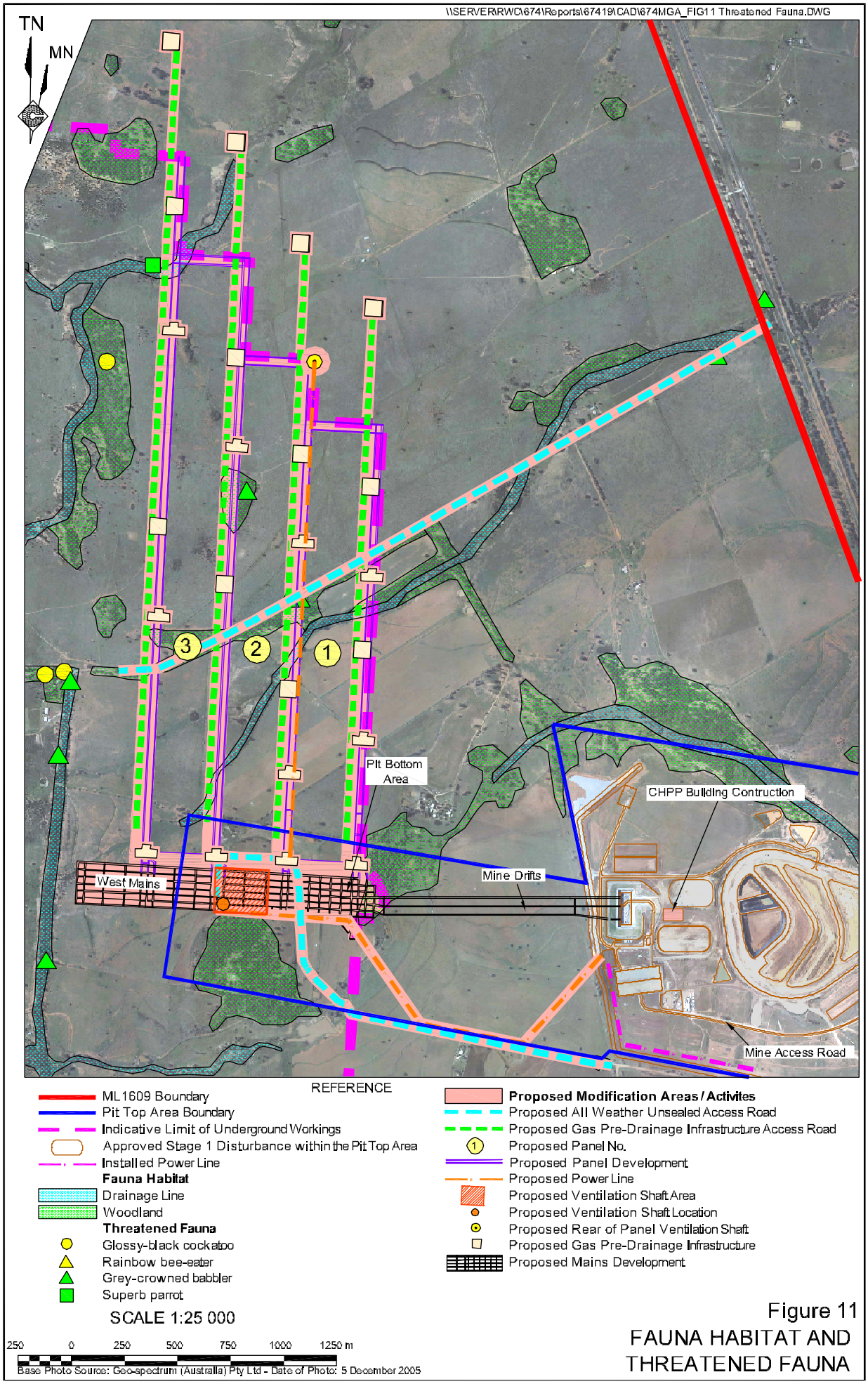


Figure 11
FAUNA HABITAT AND THREATENED FAUNA

Fauna and Noise

Given the Modification would not pose any significant additional noise generation in comparison to the construction of the approved NCM (Section 4.3), it is unlikely to change the potential noise effects on fauna.

Fauna and Blasting

Given that any blasting associated with the Modification would be significantly smaller than blasting undertaken to date (Section 4.3), it would not change the potential blasting effects on fauna.

Introduced Fauna Species

The European Rabbit, European Red Fox and Feral Cat are introduced animal species which have been recorded within ML 1609. Each of these species has a corresponding key threatening process listed under the TSC Act (NSW Scientific Committee, 2000, 2002, 2004), *viz*.:

- predation by the Feral Cat;
- competition and grazing by the Feral European Rabbit; and
- predation by the European Red Fox.

Introduced animals have the potential to increase or become concentrated in the vicinity of the mine without the appropriate measures. However, given the size of the area to be disturbed and the pest control measures currently implemented at the approved Stage 1 NCM, the potential increase or concentration of introduced animals in the vicinity of the mine as a result of the Modification is not likely to result in minimal environmental impact on fauna.

Threatened Fauna Species, Ecological Communities and Migratory Species

The assessment by Ecotone Ecological Consultants Pty Ltd (2009) assessed the potential impacts of Stage 2 of the NCM on threatened fauna species, populations and ecological communities, and their habitats in consideration of the DECCW's *Draft Guidelines for Threatened Species Assessment* (DEC, 2004).

Based on the findings of the recent survey and assessment conducted for the Stage 2 EA (which includes a much larger disturbance area than that proposed for the Modification), the disturbance area for the Modification:

- would be unlikely to significantly affect the lifecycle of a threatened fauna species and/or population;
- would be unlikely to significantly affect the habitat of a threatened fauna species, population or EEC;
- would be unlikely to significantly affect the current disturbance regimes relevant to fauna;
- would be unlikely to significantly affect habitat connectivity; and
- would not adversely affect critical habitat as no critical habitats are known to occur with the Modification area.

Matters of National Environmental Significance

The assessment by Ecotone Ecological Consultants Pty Ltd (2009) considered the potential impacts of Stage 2 of the NCM on matters of national environmental significance (including threatened fauna species and migratory species listed under the EPBC Act) in consideration of the DEWHA's *EPBC Act Policy Statement 1.1 Significant Impact Guidelines Matters of National Environmental Significance* (DEH, 2006).

Based on the findings of the recent survey and assessment conducted for the Stage 2 EA (which includes a much larger disturbance area than that proposed for the Modification) and a supplementary flora survey and assessment undertaken in September 2009 by Cenwest Environmental Services (2009), no matters of national environmental significance relevant to fauna are likely to be significantly impacted as a result of Modification.

Summary of Potential Impacts on Fauna

Given the above and the measures included in relevant management plans, which would continue to be implemented for the NCM, the Modification is unlikely to result in a significant environmental impact on fauna.

Mitigation and Management Measures

Potential impacts to fauna are currently managed via implementation of measures included in the LMP (including the RMP). These measures would continue to be implemented where relevant for the Modification.

In addition, the following measures would be implemented to minimise the potential impacts of the Modification on flora:

- A qualified ecologist would be commissioned to conduct a pre-clearance survey of proposed disturbance areas to identify whether any threatened flora species, populations or communities or their habitats are present. The pre-clearance survey would target threatened species known to occur or potentially occur in the area and would aim to identify habitat within the proposed clearance areas, particularly substantial habitat trees. All substantial habitat trees would be retained, wherever possible.
- In the event that an EEC or threatened species is identified, alternative locations or orientations of the disturbance area would be considered, if practicable.
- If the relocation or re-orientation of the area to be disturbed is not practicable (i.e. for reasons of mine/operational safety), a qualified ecologist would re-locate fauna species residing within the area proposed to be cleared.
- All clearing activities would be undertaken in accordance with a tree clearing protocol to avoid direct disturbance to nesting birds.
- The location of access tracks would be determined in consultation with a qualified ecologist, following an inspection of each proposed route and determination of the path with the least potential impact on environmental values.
- Avoid disturbance to the vegetation of the Riparian Forest along watercourses, as far as practicable.

4.10 HAZARD AND RISK

All hazardous material at the Stage 1 NCM are stored and used in accordance with the relevant material safety data sheets (MSDS). The on-site MSDS register is updated when new chemicals are brought to site. Dangerous good licenses are held for on-site explosives magazines and fuel storage.

An Emergency Procedures Manual has been developed for the NCM and outlines relevant Occupational Health and Safety and communications measures in the event of an emergency.

The Modification would not involve any variation to the approved mining rate. The Modification would require the operation of additional mobile equipment and materials deliveries associated with construction of the CHPP and ventilation infrastructure. However these deliveries and activities would be generally consistent with the types of activities that were undertaken to initially develop the NCM.

Fuel, chemical and explosives storage facilities on-site would not require any significant alteration and all materials would continue to be stored and used in accordance with the relevant MSDS and legislative requirements.

The proposed construction of the ventilation shafts, gas pre-drainage bores and CHPP would not significantly alter the risk profile of the approved NCM. The operation of the CHPP is not proposed as a component of this Modification.

The existing management and mitigation measures at the NCM would be applied to the Modification where required to minimise the hazards and risks associated with the development.

4.11 TRANSPORT

The NCM is located to the west of the Kamilaroi Highway and north of Kurrajong Creek Road which provides access over the North Western Branch Railway Line and intersects the Kamilaroi Highway to the south-east of the pit top infrastructure (Figure 12).

NCOPL has constructed a sealed 8 m wide access road that intersects Kurrajong Creek Road west of the North Western Branch Railway and has also sealed a portion of Kurrajong Creek Road and the intersection of Kaurajong Creek road and the Kamilaroi Highway.

\\SERVER\RWC\674\Reports\67419\CAD\674MGA_FIG12Transport.DWG

TN
MN

Narrabri
Namoi
River
North Western Branch Railway Line
Turrawan
ML1609
Kamilaroi Highway
Greylands Road
Scratch Road
See Detail Right
Pit Top Area
Kurrajong Creek Road
Baan Baa

REFERENCE
ML1609 Boundary
Pit Top Area Boundary
State Highway
Local Road
Railway Line
River

SCALE 1:150 000
2.5 0 2.5 5.0 7.5 km

Bourke
Walgett
Narrabri
Boggabri
See Detail Left
Gunnedah
NEWCASTLE

Existing Entrance to
"Bow Hills" Gravel Quarry
Rail Loop
North Western Branch Railway
Kamilaroi Highway
To
"Bow Hills"
Gravel Quarry

SCALE
20 0 20 40 60 80 100 m

Figure 12
EXISTING ROAD NETWORK

The Stage 1 EA indicates that during construction, the typical types and number of vehicles entering and exiting the pit top area would comprise up to (NCPL, 2007a):

- four low loaders per day;
- six heavy vehicles per day for general deliveries;
- 32 heavy vehicle delivering gravel per day; and
- 40 light vehicles per day.

The development of the CHPP, West Mains ventilation shaft and pre-mine gas drainage infrastructure would result in some limited traffic generation during construction of the Modification (i.e. additional light vehicle movements for staff and additional heavy vehicles movements).

The traffic assessment in the Stage 2 EA assessed the potential traffic impacts associated with Stage 2 of the NCM, of which the Modification components are a subset. The Stage 2 traffic assessment concluded that the level of increase in traffic numbers associated with Stage 2 of the NCM would be well within the capacity of the Kamilaroi Highway and that there would be no noticeable impact on traffic flows and congestion on the Kamilaroi Highway. The traffic assessment presented in the Stage 2 EA also concluded that those activities would not be expected to cause significant additional deterioration to road pavement condition (NCOPL, 2007b).

4.12 SOCIAL AND ECONOMIC ASPECTS

The Stage 1 NCM is providing employment and business opportunities in the Narrabri LGA and adjoining Gunnedah LGA.

The Stage 1 NCM development works have employed up to 80 construction staff and operation of the approved NCM is expected to employ up to 113 people.

The Modification would provide for the employment of an additional 35 staff during construction of the Modification components (for approximately 12 months) and would also allow NCOPL to rapidly develop Stage 2 by establishing some long lead time components, should Stage 2 of the NCM be approved.

The socio-economic assessment prepared for the Stage 2 EA, of which the Modification is a subset, concluded that Stage 2 of the NCM would be unlikely to place any strain on existing community infrastructure and housing (NCOPL, 2007b).

NCOPL would continue to encourage the employment of local people, as well as training and certification of local people to assist applicants in obtaining skills required for working at the NCM. NCM would also continue to encourage the involvement of the local indigenous community in the workforce.

5 CONCLUSION

NCOPL has requested to modify the NCM Project Approval. The Modification includes a number of changes to the currently approved Stage 1 NCM. The key aspects of the proposed modification include:

- A change in the sequence of underground panel roadway development.
- Construction and use of a ventilation shaft (the West Mains ventilation shaft) and associated surface infrastructure in area above the West Mains roadway between Stage 2 Longwalls 2 and 25), in place of the main ventilation drift.
- Construction and use of a small diameter vertical ventilation shaft (i.e. rear of panel ventilation shaft), associated with Stage 2 Longwalls 1 to 3.
- Construction and use of gas (and potentially water) pre-drainage infrastructure, involving drilling from the surface into and along the coal seam, generally within the area of Stage 2 Longwalls 1 to 3.
- Construction (but not operation) of a CHPP, immediately south of the ROM coal stockpile, within the pit top area.
- Construction and use of supporting infrastructure (e.g. access tracks, electricity spur lines surface water infrastructure and gas/water pipelines).
- Additional surface disturbance of approximately 34.6 ha of primarily cleared agricultural land. This surface disturbance would be associated with: ventilation shafts; pre-drainage boreholes; and associated supporting infrastructure (e.g. access tracks, electricity spur lines and gas/water pipelines).
- Employment of an additional 35 people over a period of approximately 12 months (i.e. during construction of the abovementioned Modification components).

These proposed changes would be located within ML 1609 and within the area assessed and approved via the Stage 1 EA.

An environmental assessment of the Modification has been conducted to evaluate the proposal and the conclusions for the relevant environmental aspects are presented below.

Land Resources

The surface disturbance associated with the Modification would result in a change in the landuse of these areas during the life of the NCM (i.e. they would not be available for agricultural use while mining activities are occurring). However, it is expected that following mine closure and rehabilitation the site would be returned to agricultural use, with some areas rehabilitated to native woodland communities comparable to the pre-mining situation. NCOPL would also implement management measures to minimise the potential impacts of the Modification on soil resources.

The proposed installation of the ventilation shaft, gas drainage activities and construction of the CHPP would involve limited cut and fill earthworks and would not significantly impact the landforms of the local area.

Gas drainage activities would be temporary in nature, and would look similar to the exploration drilling activities which have been ongoing over ML 1609 for a number of years. Beyond a distance of a few hundred metres, the activities would be virtually imperceptible with dust suppression activities undertaken to reduce dust generation, likely to be the most noticeable aspect of these operations. Once completed, the gas drainage sites would be rehabilitated to re-establish the pre-existing vegetation.

Noise and Blasting

It is considered that the Modification would not pose any significant additional noise generation in comparison to the construction or operation of the approved NCM. Regular noise monitoring would continue to be undertaken to verify continued compliance with applicable Project Approval and EPL noise criteria and to implement management measures if necessary.

Some limited blasting may be required during the establishment of the West Mains ventilation shaft. These blasts would be smaller than blasting that has been undertaken to date. Any blasts required for the West Mains ventilation shaft construction would be designed to meet applicable blast vibration and overpressure criteria at the nearest non-company owned residences.

Construction Dust Generation

Existing NCM dust management measures would be applied to the Modification construction activities. With the implementation of these measures it is not anticipated that the construction of the ventilation shafts, CHPP and gas pre-drainage would significantly alter the dust generation of the approved NCM.

Greenhouse Gas Generation

The gas pre-drainage infrastructure would enable extraction of seam gases prior to the initial development and operation of the Stage 2 longwall mining operation.

Aboriginal Heritage

There are no known Aboriginal heritage sites located at the CHPP construction site.

When constructing ventilation and gas pre-drainage infrastructure for Longwalls 1 to 3, relevant Aboriginal heritage sites would be demarcated to avoid accidental damage. Disturbance to other known Aboriginal heritage sites located above Panels 1 to 3 would be avoided where practicable. In the event that avoidance of disturbance is not considered to be practicable, salvage of the artefacts would be undertaken.

Site preparation and topsoil stripping activities would be undertaken in accordance with the ACHMP. Cultural heritage site education would also be undertaken as a component of induction for staff and contractors who may come to site to work on the Modification.

Non-Aboriginal Heritage

NCOPL completed a desktop search for Non-Aboriginal heritage listings within the extent of ML 1609 and surrounds. This desktop review indicated that the nearest registered non-Aboriginal heritage sites were located in Narrabri.

ASR also completed a field survey to record any structures, places or relics of non-Aboriginal heritage significance within ML 1609.

Water Resources

The Modification would involve the continued implementation of existing water management controls, as well as an increase in the capacity of SB1 and an additional sediment basin (SB2 – to provide additional capacity for the collection and storage of dirty runoff from the coal processing area) and a new storage dam (SD6) to collect potentially dirty runoff from the initial ventilation shaft area. Further, surface water flows within each gas pre-drainage or ventilation shaft area required for the Modification would be managed in accordance with an ESCP.

In the event of a major hydrocarbon spill, the following actions would be undertaken: contaminated soil would be collected and transported to an approved waste depot or remediated safely within ML 1609; pits would be constructed around the spill with sufficient hydraulic gradient to capture seepage water and contaminated material, enabling the pits to be pumped out; and local groundwater would be monitored for signs of further contamination.

Flora and Fauna

No threatened flora or fauna species, populations, ecological communities or their habitats are likely to be significantly affected by the proposed modification, considering aspects such as the extent of potential habitat for the species, the small scale of the proposed modification and the already generally disjunct nature of the habitat which would be removed. Given the small area of vegetation disturbance and the application of mitigation measures, the proposed modification is unlikely to significantly increase the flora and fauna impacts of the currently approved NCM.

Hazard and Risk

The proposed construction of the ventilation shafts, gas pre-drainage infrastructure and CHPP would not significantly alter the risk profile of the approved NCM. The operation of the CHPP is not proposed as a component of this Modification. The existing management and mitigation measures at the NCM would be applied to the Modification where required to minimise the hazards and risks associated with the development.

Transport

The development of the CHPP, West Mains ventilation shaft and pre-mine gas drainage infrastructure would result in some limited traffic generation during construction of the Modification. These movements would be generally within the range of the Stage 1 traffic movements and are not expected to result in any additional traffic safety or traffic capacity issues.

Social and Economic Aspects

The NCM is providing employment and business opportunities in the Narrabri LGA and adjoining Gunnedah LGA.

The Modification would provide for the employment of an additional 35 staff during construction of the Modification components (for approximately 12 months) and would also allow NCOPL to rapidly develop Stage 2 by establishing some long lead time components, should Stage 2 of the NCM be approved.

The modified NCM would be unlikely to place any strain on existing community infrastructure and housing.

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ATTACHMENT 1

STAGE 1 NARRABRI COAL MINE PROJECT APPROVAL

Project Approval

Section 75J of the *Environmental Planning and Assessment Act 1979*

I approve the project referred to in schedule 1, subject to the conditions in schedules 2 to 4.

These conditions are required to:
- prevent and/or minimise adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

Frank Sartor MP
Minister for Planning

Sydney 13th Nov, 2007

SCHEDULE 1

Application No:	05_0102
Proponent:	Narrabri Coal Pty Limited
Approval Authority:	Minister for Planning
Land:	See Appendix 1
Project:	Narrabri Coal Project

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DEFINITIONS

AEMR	Annual Environmental Management Report
BCA	Building Code of Australia
CCC	Community Consultative Committee
Day	The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
DECC	Department of Environment and Climate Change
Department	Department of Planning
Director-General	Director-General of Department of Planning, or delegate
DPI	Department of Primary Industries
DWE	Department of Water and Energy
EA	Environmental Assessment prepared for Narrabri Coal Pty Limited entitled *Narrabri Coal Project Environmental Assessment* and *Specialist Consultant Studies Compendium,* Volumes 1&2 (April 2007), including the *Response to Public and Government Agency Submissions* (June 2007) and *Preferred Project Report* (June 2007)
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPL	Environment Protection Licence issued under the *Protection of the Environment Operations Act 1997*
Evening	The period from 6pm to 10pm
GSC	Gunnedah Shire Council
Kamilaroi Highway Intersection	The intersection of the Kamilaroi Highway and the mine access road and "Bow Hills" quarry access road (see Figure 4 of Appendix 2)
km	Kilometre
Land	The whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval
Material harm to the environment	Material harm to the environment as defined in *Protection of the Environment Operations Act 1997*
Mining operations	The extraction, processing and transportation of coal on the site, including the formation of mine access drifts
Minister	Minister for Planning, or delegate
NSC	Narrabri Shire Council
Night	The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
Privately-owned land	Land that is not owned by a public agency, or a mining company (or its subsidiary)
Proponent	Narrabri Coal Pty Limited or any other person or persons who rely on this approval to carry out the project that is subject to this approval
Project	The Narrabri Coal Project described in the EA
RTA	Roads and Traffic Authority
ROM	Run-of-mine
Site	Land to which the project application applies (see Appendix 2)
Statement of Commitments	The Proponent's commitments in Appendix 4
Subsidence	Subsidence of the land surface caused by underground coal mining

SCHEDULE 2
ADMINISTRATIVE CONDITIONS

Obligation to Minimise Harm to the Environment

1. The Proponent shall implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the project.

Terms of Approval

2. The Proponent shall carry out the project generally in accordance with the:
   (a) EA;
   (b) statement of commitments (see Appendix 3); and
   (c) conditions of this approval.

   Note: The general layout of the project is shown in Figure 1 of Appendix 2.

3. If there is any inconsistency between the above documents, the later document shall prevail to the extent of the inconsistency. However, the conditions of this approval shall prevail to the extent of any inconsistency.

4. The Proponent shall comply with any reasonable and feasible requirements of the Director-General arising from the Department's assessment of:
   (a) any reports, plans, programs, strategies or correspondence that are submitted in accordance with the conditions of this approval; and
   (b) the implementation of any actions or measures contained in these reports, plans, programs, strategies or correspondence.

Limits on Approval

5. Mining operations may take place on the site for 21 years from the grant of the mining lease for the project.

   Note: Under this Approval, the Proponent is required to rehabilitate the site to the satisfaction of the Director-General and DPI. Consequently this approval will continue to apply in all other respects other than the right to conduct mining operations until the site has been rehabilitated to a satisfactory standard.

6. The Proponent shall not extract more than 2.5 million tonnes of ROM coal a year from the site.

7. The Proponent shall transport all coal from the site by rail.

Management Plans / Monitoring Programs

8. With the approval of the Director-General, the Proponent may submit any management plan or monitoring program required by this approval on a progressive basis.

Structural Adequacy

9. The Proponent shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.

   Notes:
   - *Under Part 4A of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for the proposed building works.*
   - *Part 8 of the EP&A Regulation sets out the requirements for the certification of the project.*

Demolition

10. The Proponent shall ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures*, or its latest version.

Operation of Plant and Equipment

11. The Proponent shall ensure that all plant and equipment used on site is:
    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

Planning Agreements

12. Within 12 months of this approval, the Proponent shall enter into a planning agreements with Narrabri Shire Council (NSC), Gunnedah Shire Council (GSC) and the Minister in accordance with:
    (a) Division 6 of Part 4 of the EP&A Act; and
    (b) the terms of the Proponent's offer to the Minister on 7 September 2007, which includes the matters set out in Appendix 4.

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

WATER MANAGEMENT

Note: These conditions should be read in conjunction with sections 6, 7, 8 and 11 of the Statement of Commitments.

Great Artesian Basin

1. Within 5 years of the date of this approval, the Proponent shall ensure that any loss of water flow into the Great Artesian Basin aquifers (equal to the maximum predicted impact, or the measured impact of the project, whichever is the greater), is managed, licensed or offset to the satisfaction of DWE.

   Note: The EA predicts a maximum impact of 100 megalitres a year for Great Artesian Basin aquifers in year 50 of the project.

Groundwater Model

2. Within 12 months of the commencement of mining operations, the Proponent shall undertake a transient calibration of the groundwater model presented in the EA, in consultation with DWE and DECC, and to the satisfaction of the Director-General.

3. Following the completion of the transient calibration of the groundwater model and the first annual review of the water balance, the Proponent shall prepare a Dewatering Contingency Plan. This plan must:
   (a) be prepared in consultation with DWE and DECC and to the satisfaction of the Director-General;
   (b) identify the freeboard required to prevent the evaporation/storage ponds from discharge of water under weather conditions of a 1 in 100 year 72 hour storm event for the site;
   (c) contain measures to ensure minewater is not pumped to the evaporation/storage ponds once this freeboard level is reached;
   (d) identify lead times required for the construction of a water conditioning plant to ensure the capacity of the site's evaporation /storage ponds is not exceeded (see below);
   (e) refine its estimates of quantities of salts that would be accumulated within the evaporation/storage ponds over the life of the project;
   (f) identify how it would manage and/or dispose of these accumulated salts, in consultation with DWE and DECC, and to the satisfaction of the Director-General.

4. The Proponent must commence construction of the water conditioning plant identified in condition 10(d) when daily mine dewatering volumes exceed 0.88 megalitres, or an alternative trigger point based on a review of the water balance and model and established in consultation with DWE and DECC, and approved by the Director-General.

Discharge

5. Except as may be expressly provided for by an EPL, the Proponent shall not discharge any surface waters from the site. However, product water from the water conditioning plant may be transferred to water users in accordance with an approved Water Management Plan (see below).

Evaporation/Storage Ponds

6. The Proponent shall:
   (a) construct evaporation/storage ponds incorporating the use of low permeability layers to manage minewater generated by the project;
   (b) prior to commencement of construction, submit pond designs and a construction QA/QC program to DECC; and
   (c) prior to commissioning the ponds, summit an "as constructed" report, produced by an experienced and qualified engineer, to DECC;
   to the satisfaction of the Director-General.

Water Management Plan

7. The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Director-General. This plan must be submitted to the Director-General for approval prior to the commencement of construction activities (not including the construction of the Kamilaroi Highway

intersection) in consultation with DECC and DWE by suitably qualified expert/s whose appointment/s have been approved by the Director-General and include a:

(a) Site Water Balance;
(b) Erosion and Sediment Control Plan;
(c) Surface Water Monitoring Plan;
(d) Groundwater Monitoring Program; and
(e) Surface and Groundwater Response Plan, setting out the procedures for:
    - investigating, and if necessary mitigating, any exceedances of the surface or groundwater assessment criteria (see below); and
    - responding to any unforeseen impacts of the project.

Site Water Balance

8. The Site Water Balance must:
    (a) include details of:
        - sources and security of water supply;
        - water use on site;
        - water management on site;
        - off-site water transfers;
        - reporting procedures;
    (b) describe measures to minimise water use by the project; and
    (c) be reviewed and recalculated each year in the light of the most recent water monitoring data.

Erosion and Sediment Control

9. The Erosion and Sediment Control Plan must:
    (a) be consistent with the requirements of *Managing Urban Stormwater: Soils and Construction* manual (Landcom, 2004), or its latest version;
    (b) identify activities that could cause soil erosion and generate sediment;
    (c) describe measures to minimise soil erosion and the potential for transport of sediment to downstream waters;
    (d) describe the location, function, and capacity of erosion and sediment control structures; and
    (e) describe what measures would be implemented to monitor and maintain the structures over time.

Surface Water Monitoring Program

10. The Surface Water Monitoring Plan must include:
    (a) detailed baseline data on surface water flows and quality in creeks and other waterbodies that could be affected by the project;
    (b) surface water impact assessment criteria;
    (c) a program to monitor the impact of the project on surface water flows and quality;
    (d) procedures for reporting the results of this monitoring.

Groundwater Monitoring Program

11. The Groundwater Monitoring Program must include:
    (a) further development of the regional and local groundwater model;
    (b) 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);
    (c) groundwater impact assessment criteria;
    (d) a program to monitor the impact of the project on groundwater levels, yield and quality;
    (e) a program to monitor, (by the use of shallow piezometers/lysimeters), detect, and quantify any leakage from the site's evaporation/storage ponds; and
    (f) procedures for reporting the results of this monitoring.

NOISE

Note: These conditions should be read in conjunction with section 15 of the Statement of Commitments.

Impact Assessment Criteria

12. The Proponent shall ensure that the noise generated by the project does not exceed the levels set out in Table 1 at any privately-owned residence.

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
All privately owned residences	35	35	35	45

Table 1: Impact assessment criteria dB(A)

Notes:

- *To determine compliance with the $L_{Aeq(15\ minute)}$ limit, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.*
- *These limits apply under the relevant meteorological conditions outlined in the assessment procedures in Chapter 5 of the NSW Industrial Noise Policy.*
- *To determine compliance with the $L_{A1(1\ minute)}$ noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).*
- *These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.*

Continuous Improvement

13. The Proponent shall:
    (a) implement all reasonable and feasible best practice noise mitigation measures;
    (b) investigate ways to reduce the noise generated by the project, including off-site road and rail noise and maximum noise levels which may result in sleep disturbance; and
    (c) report on these investigations and the implementation and effectiveness of these measures in the AEMR,

    to the satisfaction of the Director-General.

Monitoring

14. The Proponent shall prepare and implement a Noise Monitoring Program for the project to the satisfaction of the Director-General. This program must:
    (a) be submitted to the Director-General for approval prior to the commencement of construction activities;
    (b) be prepared in consultation with the DECC;
    (a) use attended noise monitoring measures to monitor the performance of the project
    (c) include a protocol to establish whether the project is complying with the noise impact assessment criteria in Table 1.

BLASTING AND VIBRATION

Note: These conditions should be read in conjunction with section 2 of the Statement of Commitments.

Airblast Overpressure Limits

15. The Proponent shall ensure that the airblast overpressure level from blasting at the project does not exceed the criteria in Table 2 at any residence on privately-owned land.

Airblast overpressure level (dB(Lin Peak))	Allowable exceedance
115	5% of the total number of blasts in a 12 month period
120	0%

Table 2: Airblast overpressure impact assessment criteria

Note: The overpressure values in Table 2 apply when the measurements are performed with equipment having a lower cut-off frequency of 2 Hz or less. If the instrumentation has a higher cut-off frequency a correction of 5 dB should be added to the measured value. Equipment with a lower cut-off frequency exceeding 10 Hz should not be used.

Ground Vibration Impact Assessment Criteria

16. The Proponent shall ensure that the ground vibration level from blasting, or any other activity at the project does not exceed the criteria in Table 3 at any residence on privately-owned land.

Peak particle velocity (mm/s)	Allowable exceedance
5	5% of the total number of blasts in a 12 month period
10	0%

Table 3: Ground vibration impact assessment criteria

Blasting Hours

17. The Proponent shall only carry out blasting associated with construction activities on site between 10 am and 4pm Monday to Friday.

Blasting Frequency

18. The Proponent may carry out:
    (a) a maximum of 2 blasts a day associated with construction activities; and
    (b) 5 blasts a week associated with construction activities, averaged over a 12 month period;
    on site without the written approval of the Director-General.

Property Inspections

19. Before carrying out any blasting, the Proponent shall advise all landowners within 2 km of proposed blasting activities, and any other landowner nominated by the Director-General, that they are entitled to a property inspection.

20. If the Proponent receives a written request for a property inspection from any landowner within 2 km of proposed blasting activities, or any other landowner nominated by the Director-General, the Proponent shall within 3 months of receiving this request:
    (a) commission a suitably qualified person, whose appointment has been approved by the Director-General, to inspect the condition of any building or structure on the land, and recommend measures to mitigate any potential blasting impacts; and
    (b) give the landowner a copy of this property inspection report.

Property Investigations

21. If any landowner within a 2 km of proposed blasting activities, or any other landowner nominated by the Director-General, claims that his/her property, including vibration-sensitive infrastructure such as water supply or underground irrigation mains, has been damaged as a result of blasting at the project, the Proponent shall within 3 months of receiving this request:
    (a) commission a suitably qualified person whose appointment has been approved by the Director-General to investigate the claim; and

(b) give the landowner a copy of the property investigation report.

If this independent investigation confirms the landowner's claim, and both parties agree with these findings, then the Proponent shall repair the damages to the satisfaction of the Director-General.

If the Proponent or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Director-General for resolution.

Monitoring

22. Prior to the commencement of blasting, the Proponent shall prepare and implement a detailed Blasting Monitoring Program for the project to the satisfaction of the Director-General.

AIR QUALITY

Note: These conditions should be read in conjunction with section 13 of the Statement of Commitments.

Impact Assessment Criteria

23. The Proponent shall ensure that dust emissions generated by the project does not cause additional exceedances of the criteria listed in Tables 4 to 6 at any residence on privately owned land, or on more than 25 percent of any privately-owned land.

Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90 µg/m^3
Particulate matter < 10 µm (PM_{10})	Annual	30 µg/m^3

Table 4: Long term impact assessment criteria for particulate matter

Pollutant	Averaging period	Criterion
Particulate matter < 10 µm (PM_{10})	24 hour	50 µg/m^3

Table 5: Short term impact assessment criteria for particulate matter

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 g/m^2/month	4 g/m^2/month

Table 6: Long term impact assessment criteria for deposited dust

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS/NZS 3580.10.1-2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.

Monitoring

24. The Proponent shall prepare and implement an Air Quality Monitoring Program for the project to the satisfaction of the Director-General. This program must:
    (a) be submitted to the Director-General prior to the commencement of construction activities (not including the construction of the Kamilaroi Highway intersection);
    (b) be prepared in consultation with the DECC; and
    (c) use a combination of high volume samplers and dust deposition gauges to monitor the performance of the project.

METEOROLOGICAL MONITORING

25. During the project, the Proponent shall ensure there is a suitable meteorological station on site that complies with the requirements in *Approved Methods for Sampling of Air Pollutants in New South Wales* (DECC, 2007), or its latest version.

SUBSIDENCE

Subsidence Impact Limits

26. The Proponent shall ensure that the project does not result in subsidence impacts of greater than 20 mm vertical subsidence on any land.

Notification of Landowners

27. Six months prior to mining occurring under each privately owned property, the Proponent shall notify the relevant landowner/s of the extent of planned mining operations under their property.

LANDSCAPE MANAGEMENT

Note: These conditions should be read in conjunction with sections 5, 9 and 11 of the Statement of Commitments.

Rehabilitation

28. The Proponent shall rehabilitate the site to the satisfaction of the Director-General and DPI.

Landscape Management Plan

29. The Proponent shall prepare and implement a detailed Landscape Management Plan for the site to the satisfaction of the Director-General and DPI. This plan must:
    (a) be submitted to the Director-General for approval within 12 months of this approval;
    (b) be prepared by suitably qualified expert/s whose appointment/s have been endorsed by the Director-General;
    (c) be prepared in consultation with DWE, DECC and NSC; and
    (d) include a:
        - Rehabilitation Management Plan; and
        - Mine Closure Plan.

Rehabilitation Management Plan

30. The Rehabilitation Management Plan must include:
    (a) the rehabilitation objectives for the site;
    (b) a strategic description of how the rehabilitation of the site would be integrated with surrounding land use;
    (c) a general description of the short and long term measures that would be implemented to rehabilitate the site;
    (d) a detailed description of the measures that would be implemented to rehabilitate the site, including the measures to be implemented for:
        - managing the remnant vegetation and habitat on site;
        - minimising impacts on fauna;
        - minimising visual impacts;
        - conserving and reusing topsoil;
        - controlling weeds, feral pests, and access;
        - managing bushfires; and
        - managing any potential conflicts between the rehabilitation works and Aboriginal cultural heritage.
    (e) detailed performance and completion criteria for the rehabilitation of the site;
    (f) a detailed description of how the performance of the rehabilitation works would be monitored over time to achieve the stated objectives and against the relevant performance and completion criteria; and
    (g) details of who is responsible for monitoring, reviewing and implementing the plan.

Mine Closure Plan

31. The Mine Closure Plan must:
    (a) define the objectives and criteria for mine closure;
    (b) investigate options for the future use of the site;
    (c) provide a detailed methodology for decommissioning the site's evaporation/storage ponds and the treatment of any accumulated salt within or around those ponds;
    (d) investigate ways to minimise the adverse socio-economic effects associated with mine closure, including reduction in local and regional employment levels;
    (e) describe the measures that would be implemented to minimise or manage the on-going environmental effects of the project; and
    (f) describe how the performance of these measures would be monitored over time.

HERITAGE

Note: These conditions should be read in conjunction with section 10 of the Statement of Commitments.

Aboriginal Cultural Heritage Management Plan

32. The Proponent shall not destroy any known Aboriginal objects (as defined in the *National Parks and Wildlife Act 1974*) without the written approval of the Director-General.

33. The Proponent shall prepare and implement an Aboriginal Cultural Heritage Management Plan for the project to the satisfaction of the Director-General. This plan must:
    (a) be submitted the Director-General prior to the commencement of construction activities (not including the construction of the Kamilaroi Highway intersection);
    (b) be prepared in consultation with the DECC and the Narrabri Local Aboriginal Land Council;
    (c) include a protocol for the ongoing consultation and involvement of Aboriginal communities in the conservation and management of Aboriginal heritage on site;
    (d) describe the measures that would be implemented to protect Aboriginal sites on site, or if any new Aboriginal objects or skeletal remains are discovered during the project.

TRANSPORT

Note: These conditions should be read in conjunction with section 14 of the Statement of Commitments.

Kamilaroi Highway Intersection

34. The Proponent shall construct the Kamilaroi Highway intersection in consultation with NSC and to the satisfaction of RTA. This intersection must:
    (a) be completed, other than for items listed in (c) below, prior to the commencement of construction activities on site (with the exception of construction of the Access Road);
    (b) be constructed in accordance with a Traffic Management Plan approved by NSC and RTA;
    (c) include boom gates, flashing lights and warning bells for the Kurrajong Creek Road level crossing, to the satisfaction of ARTC and NSC;
    (d) include illumination of the Kurrajong Creek Road level crossing during construction of the intersection;
    (e) provide a information sign on Kurrajong Creek Road to inform road users of likely delays due to train traffic; and
    (f) maintain permanent access for the "Bow Hills" quarry.

Kurrajong Creek Road

35. Within 12 months of commencement of mining operations, the Proponent shall bitumen seal Kurrajong Creek Road (Shire Road 188) for a distance of 7 km south of the Kamilaroi Highway intersection (see Figure 2 of Appendix 2), to the satisfaction of NSC.

VISUAL IMPACT

Note: These conditions should be read in conjunction with section 12 of the Statement of Commitments.

Visual Amenity

36. The Proponent shall minimise the visual impacts of the project to the satisfaction of the Director-General.

Lighting Emissions

37. The Proponent shall ensure that:
    (a) no outdoor lights shine above the horizontal; and
    (b) all external lighting associated with the project complies with *Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*.

GREENHOUSE GAS

Note: These conditions should be read in conjunction with section 13 of the Statement of Commitments.

Energy Savings Action Plan

38. The Proponent shall prepare and implement an Energy Savings Action Plan for the project to the satisfaction of the Director-General. This plan must:
    (a) be prepared in consultation with DECC;
    (b) be prepared in accordance with the *Guidelines for Energy Savings Action Plans* (DEUS, 2005), or its latest version;
    (c) be submitted to the Director-General for approval within 3 months of this approval; and
    (d) include a program to monitor the effectiveness of measures to reduce energy use on site.

Gas Drainage

39. The Proponent shall implement all reasonable and feasible measures to minimise the greenhouse gas emissions from the underground mining operations to the satisfaction of the Director-General.

40. Prior to carrying out underground coal mining operations, the Proponent shall submit a Greenhouse Gas Minimisation Plan to the Director-General. This plan must:
    (a) identify options for minimising greenhouse gas emissions from underground mining operations, with a particular focus on capturing and/or using these emissions;
    (b) investigate the feasibility of implementing each option;
    (c) propose the measures that would be implemented in the short to medium term on site; and
    (d) include a research program to inform the continuous improvement of the greenhouse gas minimisation measures on site.

WASTE

Note: These conditions should be read in conjunction with section 9 of the Statement of Commitments.

Waste Minimisation

41. The Proponent shall prepare and implement a Waste Management Plan for the project to the satisfaction of the Director-General. This plan must:
    (a) be submitted to the Director-General for approval prior to commencing of construction;
    (b) identify the various waste streams of the project;
    (c) describe what measures would be implemented to reuse, recycle, or minimise the waste generated by the project;
    (d) ensure irrigation of treated wastewater is undertaken in accordance with *Environmental Guidelines: Use of Effluent by Irrigation* (DEC, 2004), or its latest version; and
    (e) include a program to monitor the effectiveness of these measures.

SCHEDULE 4

ENVIRONMENTAL MANAGEMENT, MONITORING, AUDITING AND REPORTING

Note: This schedule should be read in conjunction with sections 18 and 19 of the Statement of Commitments.

ENVIRONMENTAL MANAGEMENT STRATEGY

1. The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. This strategy must be submitted to the Director-General prior to the commencement of construction activities, and:
   (a) provide the strategic context for environmental management of the project;
   (b) identify the statutory requirements that apply to the project;
   (c) describe in general how the environmental performance of the project would be monitored and managed;
   (d) describe the procedures that would be implemented to:
      - keep the local community and relevant agencies informed about the operation and environmental performance of the project;
      - receive, handle, respond to, and record complaints;
      - resolve any disputes that may arise during the course of the project;
      - respond to any non-compliance;
      - manage cumulative impacts; and
      - respond to emergencies; and
   (e) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project.

ENVIRONMENTAL MONITORING PROGRAM

2. The Proponent shall prepare and implement an Environmental Monitoring Program for the project to the satisfaction of the Director-General. This program must be submitted to the Director-General within 6 months of this approval and consolidate the various monitoring requirements in schedule 3 of this approval into a single document.

REPORTING

Incident Reporting

3. As soon as practicable, and in any event within 24 hours of detecting an exceedance of the limits/performance criteria in this approval or the occurrence of an incident that causes (or may cause) material harm to the environment, the Proponent shall notify the Department and other relevant agencies of the exceedance/incident.

4. Within 6 days of notifying the Department and other relevant agencies of an exceedance/incident, the Proponent shall provide the Department and these agencies with a written report that:
   (a) describes the date, time, and nature of the exceedance/incident;
   (b) identifies the cause (or likely cause) of the exceedance/incident;
   (c) describes what action has been taken to date; and
   (d) describes the proposed measures to address the exceedance/incident.

Annual Reporting

5. Within 12 months of this approval, and annually thereafter, the Proponent shall submit an AEMR to the Director-General and to all relevant agencies. This report must:
   (a) identify the standards and performance measures that apply to the project;
   (b) describe the works carried out in the last 12 months;
   (c) describe the works that would be carried out in the next 12 months;
   (d) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years;
   (e) include a summary of the monitoring results for the project during the past year;
   (f) include an analysis of these monitoring results against the relevant:
      - impact assessment criteria/limits;
      - monitoring results from previous years; and

- predictions in the EA;

(g) identify any trends in the monitoring results over the life of the project;
(h) identify any non-compliance during the previous year; and
(i) describe what actions were, or are being, taken to ensure compliance.

INDEPENDENT ENVIRONMENTAL AUDIT

6. Within 2 years of this approval, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:
   (a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;
   (b) include consultation with the relevant agencies
   (c) assess the environmental performance of the project and assess whether it is complying with the relevant requirements of this approval and any relevant mining lease or EPL (including any strategy, plan or program required under these approvals);
   (d) review the adequacy of strategies, plans or programs required under these approvals; and, if appropriate,
   (e) recommend measures or actions to improve the environmental performance of the project, and/or any strategy, plan or program required under these approvals.

   Note: This audit team must be led by a suitably qualified auditor and include experts in the fields of water and noise management.

7. Within 6 weeks of the completing of this audit, or as otherwise agreed by the Director-General, the Proponent shall submit a copy of the audit report to the Director-General, together with its response to any recommendations contained in the audit report.

8. Within 3 months of submitting the audit report to the Director-General, the Proponent shall review, and if necessary revise the strategies/plans/programs required under this approval to the satisfaction of the Director-General.

COMMUNITY CONSULTATIVE COMMITTEE

9. Within 3 months of this approval, the Proponent shall establish a Community Consultative Committee (CCC) for the project to the satisfaction of the Director-General, in general accordance with the *Guideline for Establishing and Operating Community Consultative Committees for Mining Projects (Department of Planning, 2007)*, or its latest version.

ACCESS TO INFORMATION

10. Within 3 months of the approval of any strategy/plan/ program required under this approval (or any subsequent revision of these strategies/plans/ programs), or the completion of the audits or AEMRs required under this approval, the Proponent shall:
    (a) provide a copy of the relevant document/s to the relevant agencies and CCC; and
    (b) put a copy of the relevant document/s on its website.

11. During the project, the Proponent shall:
    (a) make a summary of monitoring results required under this approval publicly available at the mine and on its website; and
    (b) update these results on a regular basis (at least every three months).

APPENDIX 1
SCHEDULE OF PROJECT LAND

Area	***Land Title Reference***
Pit Top Area	*Part Lot 60 DP 757124* *Part Lots 151 & 152 DP 816020.*
Indicative Mining Area	*Part Lots 57, 58, 63 to 65, 81 to 84 & 115 DP 757124* *Lot 61 DP 757124* *Part Lot 1 DP 811171, Lot 2 DP 811171* *Part Lots 3, 8, 25, 67 & 68 DP 757104* *Lot 7 DP 757104* *Part Lot 152 DP 816020* *Lot 1 DP 659899, Part Lot 3 DP 1005608* *Part Pilliga East State Forest* *Various Crown roads.*
Remainder of Project Site	*Lots 381 & 382 DP 1028753* *Part Lot 1 DP 798487* *Part Lots 57, 58, 60, 63 to 65, 81 to 84, 115 DP 757124* *Part Lot 1 DP 811171* *Part Lots 3, 8, 10, 25, 67 & 68 DP 757104* *Part Lot 3 DP 1005608* *Part Lots 151 & 152 DP 816020* *Part Pilliga East State Forest* *Various Crown roads.*

APPENDIX 2
PROJECT MAPS

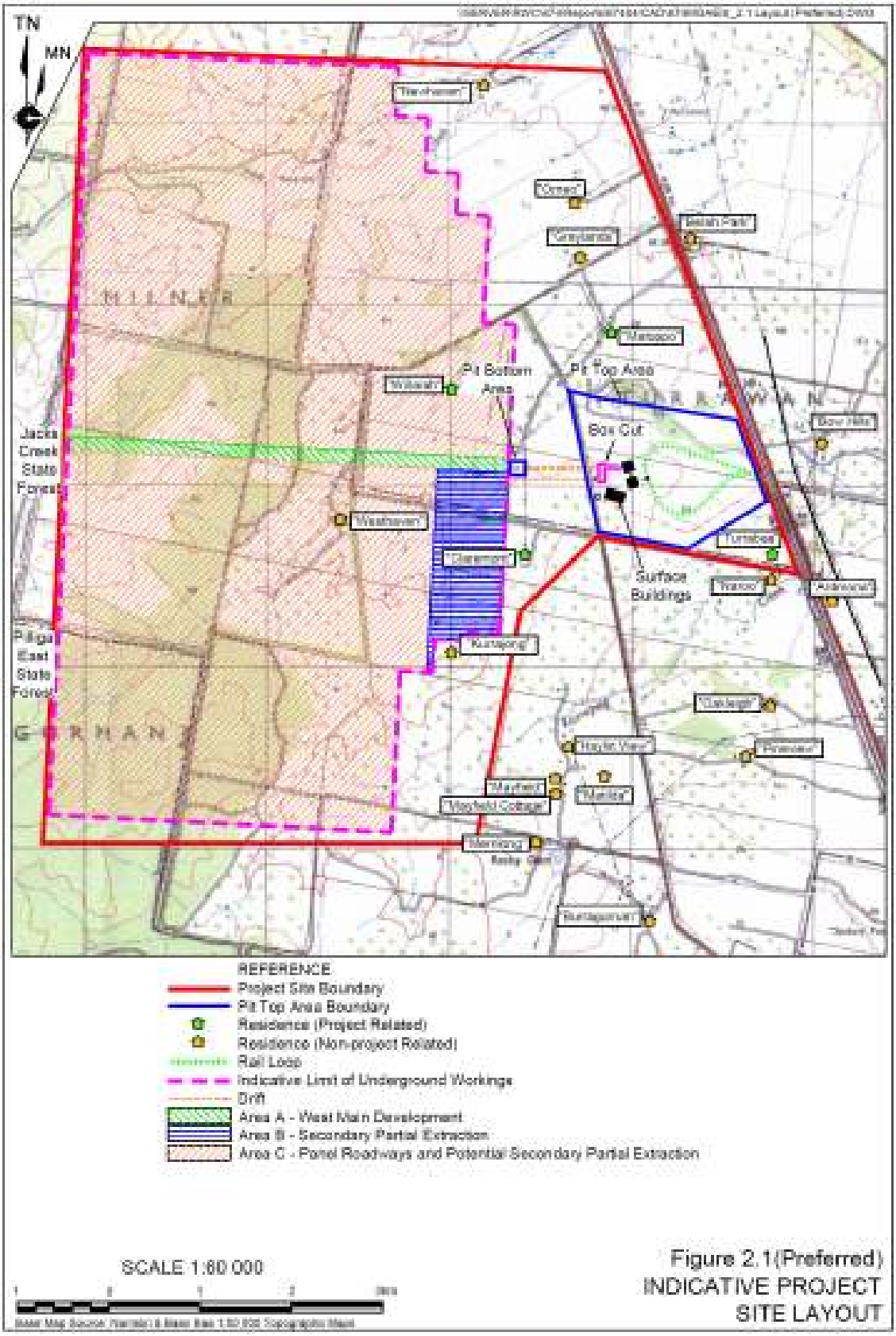

Figure 1: *Project Layout*

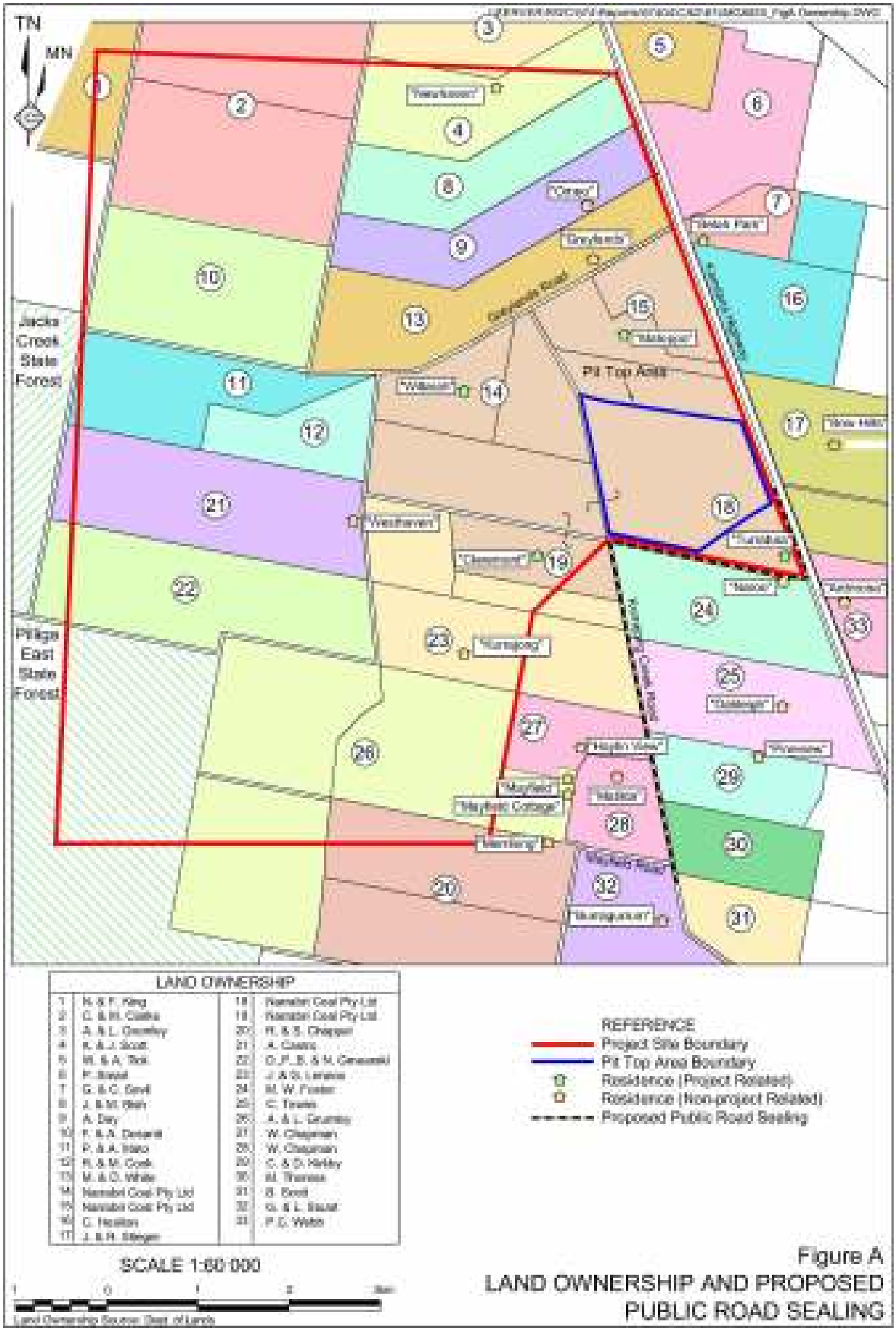

Figure 2: *Section of Kurrajong Creek Road proposed to be sealed*

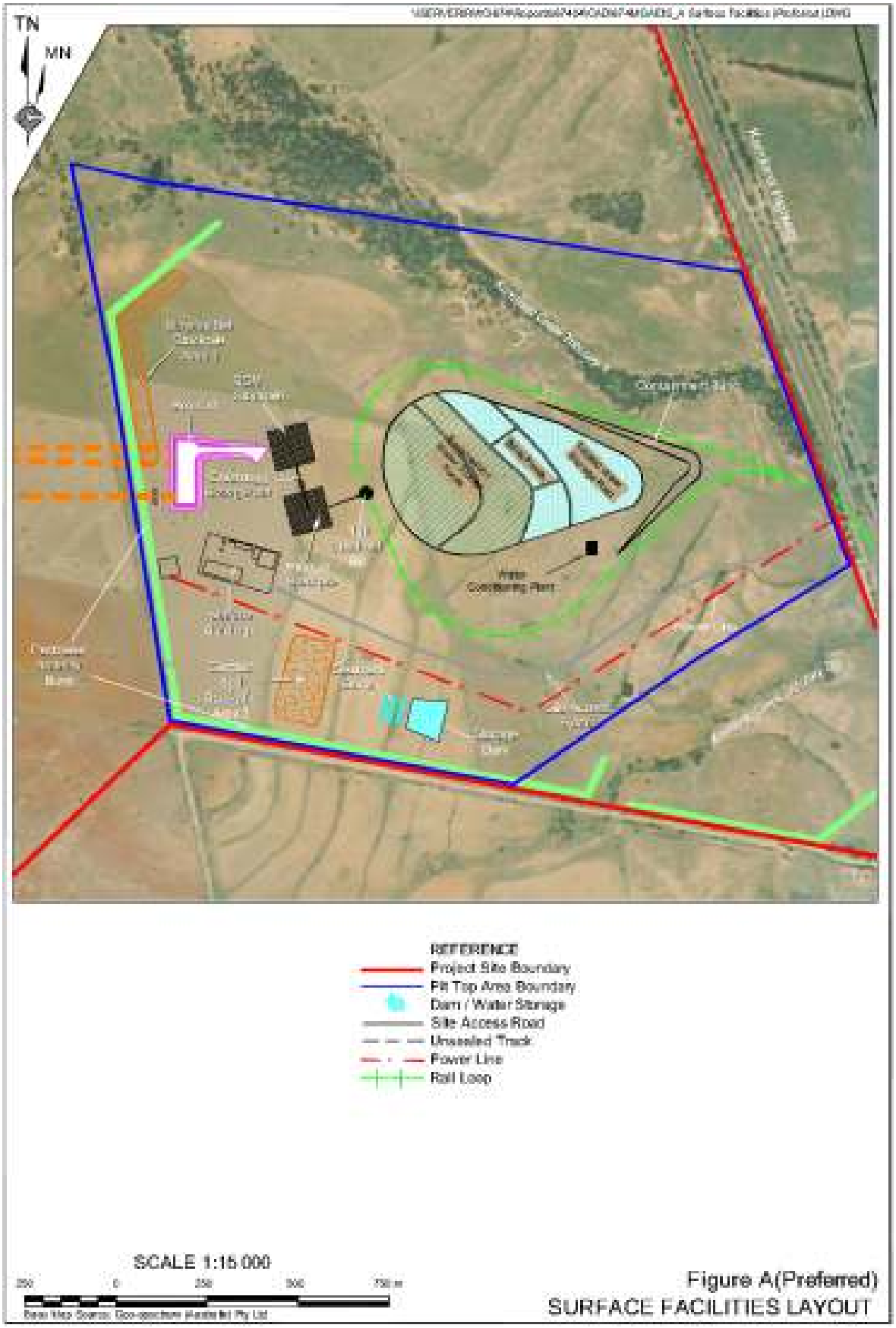

Figure 3: *Surface Facilities Layout*

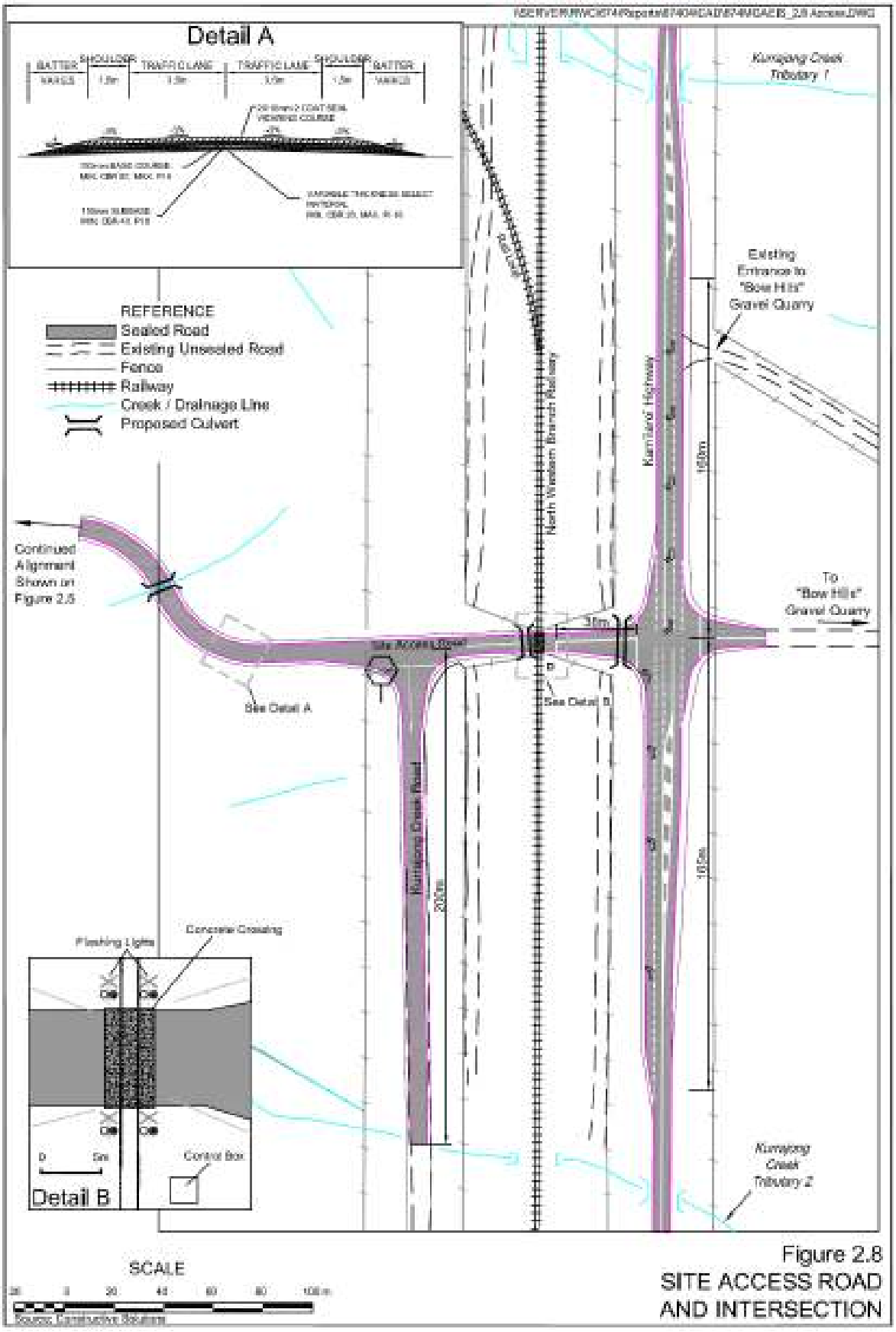

Figure 4: *Proposed Kamilaroi Highway Intersection*

APPENDIX 3
STATEMENT OF COMMITMENTS

APPENDIX 4
GENERAL TERMS OF PLANNING AGREEMENTS

Funding Area	Minimum Proponent Contribution	Funding Time Frame
Narrabri Shire Upgrade and seal Kurrajong Creek Road, adjacent to the Project site	7.0 kilometres length of Kurrajong Creek Road to be upgraded and sealed.	Works to be completed within 12 months of this approval.
Narrabri Shire Monetary Contribution – Provision of bush fire services	$7,000	One instalment to be paid within 12 months of this approval.
Narrabri Shire Community Infrastructure Contribution	$93,000	An initial instalment of $13,000 to be paid within 12 months of this approval with $20,000 to paid for a period of four years on the anniversary of the initial payment.
Gunnedah Shire Monetary Contribution – Gunnedah Urban Riverine Scheme	$100,000	$20,000 each year for a period of 5 years with the first instalment to be paid within 12 months of this approval.

Notes:

- The Gunnedah Urban Riverine Scheme Contributions must be reviewed and adjusted to take into account any increase in the CPI over time, in accordance with the Planning Agreement between the Proponent and Gunnedah Shire Council required under this approval.
- The Community Infrastructure Contribution must be reviewed and adjusted to take into account any increase in the CPI over time, in accordance with the Planning Agreement and Narrabri Shire Council required under this approval.