Ashton Coal Project

ENVIRONMENTAL ASSESSMENT

FOR THE MODIFICATION OF DA 309-11-2001-i (MOD 9)

COMPRISING

UPCAST VENTILATION SHAFT, FANS AND MINE SERVICE INFRASTRUCTURE

FEBRUARY 2012

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Draft 01	15/11/2011	Environmental Assessment in support of a S75W modification application to DA 309-11-2001-i – MOD 9	P.Burns / A.Wells Wells Environmental Services	A. Wells	A. Wells
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1 INTRODUCTION

Ashton Coal Operations Pty Ltd (ACOL) operates the Ashton Coal Project (ACP) located near Camberwell in the Singleton local government area of New South Wales. The ACP comprises an open cut mine an underground mine, a coal handling and preparation plant, coal stockpiles, rail loading infrastructure and associated surface facilities.

ACOL is proposing to modify the development consent (DA 309-11-2001-i) for the ACP to enable the development and operation of additional support infrastructure for the underground mine. The proposed modification (DA 309-11-2001-i MOD 9) involves the construction and operation of a 5.5metre (m) diameter upcast ventilation shaft and fans; two (2) mine service drop holes (nominally up to 1m in diameter); and associated ancillary services.

The ventilation shaft will enable the continued safe operation of the underground mine by providing additional mine ventilation arrangements for the Upper Liddell and deeper coal seams as the mine progresses. The mine service drop holes will enable the delivery of construction materials required for underground operations (i.e. concrete and gravel) directly to the Upper Liddell Seam workings, which will provide significant operational efficiencies and energy savings. The proposed infrastructure arrangements are a common requirement for underground mines. The location and access of the proposed infrastructure is shown in **Figure 1**.

The proposed amendments will not alter the overall area of the ACP or the mining method. There will be no increase in the rate of coal extraction, production or frequency of rail loading and off-site rail transport to that already approved by DA 309-11-2001-i.

This Environmental Assessment (EA) report has been prepared to support an application to modify DA 309-11-2001-i pursuant to the provisions of clause 12 to Schedule 6A of the *Environmental Planning and Assessment Act 1979*.

The EA includes an assessment of the impacts of the proposed development on the surrounding environment, and is supported by specialist technical reports on noise; air quality and greenhouse gas; Aboriginal cultural heritage; terrestrial ecology; traffic; and visual amenity. With the implementation of appropriate controls, the development and operation of the additional infrastructure will have negligible impact on the surrounding environment or community and will ensure the safe and efficient continuation of the existing approved underground mine.

The EA has been prepared with the assistance of Wells Environmental Services (WES), Spectrum Acoustics Pty Limited (Spectrum), PAEHolmes Pty Ltd (PAEHolmes), Insite Heritage Pty Ltd (Insite), Pacific Environmental Associates Pty Ltd (PEA), AECOM Pty Ltd (AECOM), Sinclair Knight Merz Pty Ltd (SKM) and Safe Production Solutions Pty Ltd (SPS).

Location and Access Route

Figure 1

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2 BACKGROUND

2.1 The Proponent

ACOL is an unincorporated joint venture (JV) company comprising the following ownership:

- Yancoal Australia Pty Limited (90%).
- ICRA Ashton (10%).

Yancoal is the managing operator of the ACP. It also owns and operates the Austar Coal Mine (near Cessnock); has an 80% share in the ownership and is the operator of the Moolarben Coal Mine (near Mudgee); and is one of six equity partners in the Newcastle Coal Infrastructure Group (NCIG). Yancoal also owns and operates the Yarrabee Coal Mine and Cameby Downs Mine in Queensland and Premier Coal Mine in Western Australia, and is one of eight owners of Stage One of the Wiggins Island Coal Terminal (WICET) in Queensland. Yancoal is a wholly owned subsidiary of Yanzhou Coal Mining Company Limited.

ACOL is the proponent for the modification application.

2.2 Ashton Coal Project

On 11 October 2002, the Minister for Planning granted development consent for the ACP. The approved development comprises an open cut and underground mine; coal handling and preparation plant (CHPP); run of mine (ROM) coal and product coal stockpiles; rail loading facilities; surface support facilities; and off-site product transport via rail to the Port of Newcastle.

Since the grant of development consent, ACOL has applied to modify the mine on eight separate occasions, a summary of which is provided below:

- DA 309-11-2001-i MOD 1, allowing for consented operational noise limits to be varied by the Environment Protection Authority within an Environment Protection Licence for the development. The modification was approved on 15 October 2003.
- DA 309-11-2001-i MOD 2, allowing for an increase in the height of the Eastern Emplacement Area. The modification was approved on 27 January 2005.
- DA 309-11-2001-i MOD 3, allowing for the construction and operation of tailings pipelines between the mine and the former Ravensworth Mine. The modification was approved on 29 February 2007.
- DA 309-11-2001-i MOD 4, allowing for the development and mining of an additional longwall/miniwall panel in the Pikes Gully Seam of the underground mine, an increase in underground mine production (from 2.95 to 3.2 million tonnes per annum (Mtpa)) and amendment of conditions. The modification was approved on 26 March 2010.
- DA 309-11-2001-i MOD 5, allowing for an increase in the rate of underground ROM coal extraction, increase in through put of the CHPP and product coal rail transport and the integration of the South East Open Cut (SEOC) Project (when approved) with the ACP. The modification is currently under consideration by the Department of Planning and Infrastructure (DP&I).
- DA 309-11-2001-i MOD 6, allowing for longwall mining that may result in direct hydraulic connection with the overlying Bowmans Creek alluvial aquifer, diversion of Bowmans Creek and amendment of conditions. The modification was approved on 24 December 2010.
- DA 309-11-2001-i MOD 7, allowing for the installation of 15 gas drainage holes over the underground operations, extension of the open cut operation to allow mining of an additional

100,000 tonnes of ROM coal and amending the wording of condition 3.14 to Schedule 2 of the development consent. The modification was approved on the 15 June, 2011.

- DA 309-11-2001-I MOD 8, allowing for removal of condition 1.20 to Schedule 2 to enable development of gas drainage holes as contemplated in DA 309-2001-I MOD 7. The modification is currently under consideration by the DP&I.

The ACP (as currently modified) is approved to produce up to 5.45Mtpa of ROM coal for a period of 21 years from the grant of mining lease. A summary of the existing approved ACP is provided in **Table 1**.

Table 1: Summary of the existing approved Ashton Coal Project

Aspect	Approved Operations
Project life	21 years from grant of mining lease (to 2023).
Mine production	Up to 5.45 Mtpa ROM coal.
Open cut operation	Coal to be mined over a period of about 7 years from the Arties, Pikes Gully, Upper Liddell, Upper Lower Liddell and Lower Barrett coal seams in two pits – Arties and Barrett pits comprising the North East Open Cut (NEOC).
	Construction of environmental bunds.
	Construction of the Eastern Emplacement Area (north of the highway) to RL135 m.
	Final void filled with reject material.
	Progressive rehabilitation to mixed woodland and pasture end use.
Underground operation	Coal to be mined over a period of about 18 years from the Pikes Gully, Upper Liddell, Upper Lower Liddell and Lower Barrett coal seams via a descending longwall arrangement.
	Highwall entry from Arties Pit north of New England Highway, with main headings aligned beneath and parallel to highway.
	Extraction of up to 3.2 Mtpa of ROM coal.
	Diversion of Bowmans Creek.
Coal handling, preparation, and processing	Construction and operation of pit top facilities for coal preparation, stockpiling and train loading.
	Coarse and fine rejects disposal within Ravensworth and NEOC mine voids.
Water	Supplied from site run-off, mine dewatering, excess mine water from neighbouring mines (under sharing agreement), potable water collected from roof tops and imported where required.
Support facilities and utilities	Offices, workshops, stores, bathhouses and vehicle parking areas.
	Power, telecommunications and water supply infrastructure.
Conservation and offsets	Conservation Agreement under Part 4 Division 12 of National Parks And Wildlife Act 1974 for 65.66 ha of land known as the “Conservation Area”. The agreement recognises that the Conservation Area contains Aboriginal cultural heritage and flora and fauna species of significant conservation value while acknowledging that ACOL may carry out certain disturbance activities in the course of undermining the area.
Mine access	Off Glennies Creek Road, Camberwell.

Operating hours	Open cut operations 7am to 10pm Monday to Saturday and 8am to 10pm Sunday and Public Holidays.
	Blasting 9am to 5pm Monday to Saturday.
	Underground operations 24 hours a day, 7 days a week.
	Coal handling and preparation, rail loading and off-site rail transport 24 hours a day 7 days a week.
Employment	Up to 386 full time employees.

ACOL is currently making arrangements to progress longwall mining from the Pikes Gully Seam to the Upper Liddell Seam (the next deepest seam), with mining expected to commence in the second or third quarter of 2012.

Open cut mining ceased in September 2011.

2.3 Location and Setting

The ACP is situated 14 kilometres (km) northwest of Singleton, at Camberwell, in the Hunter Valley, NSW (Figure 1).

The open cut mine (NEOC) is bounded to the north and west by the Main Northern Railway line, to the south by the New England Highway and to the southeast and east by Glennies Creek Road, Glennies Creek and Camberwell. The underground mine is bounded to the north by the New England Highway and NEOC, to the west by the Ravensworth underground mine, to the south by the Hunter River and to the east by Glennies Creek.

Land uses in surrounding areas include large scale intensive coal mining (open cut and underground), agriculture (pasture, grazing and dairy), major linear infrastructure (New England Highway, Main Northern Railway, 66 and 132 kilovolt (kV) powerlines, and optic fibre telecommunications cable) and rural residences.

There are currently only four (4) privately-owned residences within Camberwell and a further three (3) rural residences on larger properties within about 2.5 km of the proposed development site. The closest private residence to the vent shaft and mine service drop holes is approximately 1km to the east, in Camberwell.

2.4 Land Development Schedule

All aspects of the proposed modification relate to development on land within the disturbance limits of the existing approved ACP. Hence there is no addition or change to the land development schedule described in the original consent in Schedule 1 to DA 309-11-2001-i. ACOL owns the land on which the proposed infrastructure will be developed (Lot 3 DP 1114623).

2.5 Stakeholder Consultation

ACOL has discussed the proposed development consent amendments with its Community Consultative Committee (including Singleton Shire Council and community representatives); NSW Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS) – Division of Resources and Energy (DRE); and the NSW Department of Planning and Infrastructure (DP&I).

ACOL has also consulted with and discussed the proposed development consent amendments with its registered Aboriginal community stakeholder groups. This included providing an information package on the proposed development and field visits to the development site.

3 APPROVAL FRAMEWORK

3.1 Environmental Planning and Assessment Act 1979

The ACP was granted development consent as State significant and integrated development by the Minister for Planning in October 2002, under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The request to modify DA 309-11-2001-i is made pursuant to the provisions of clause 12 to Schedule 6A of the EP&A Act and clause 8J(8)(c) of the *Environmental Planning and Assessment Regulations 2000*. These provisions prescribe that the ACP can be taken as approved under Part 3A (EP&A Act) for the purposes of a modification and can be modified under section 75W of the now repealed Part 3A (EP&A Act).

A political donations disclosure statement has been provided, in accordance with section 147 of the EP&A Act.

3.2 Other State Legislation

A summary of other potentially relevant State legislation and its applicability to the modification application is provided in **Table 2**.

Table 2: Summary of other NSW legislation relevant to the modification application

Legislation	Licence or approval	Required	Comment
State Environmental Planning Policy (SEPP) No 44 – Koala Habitat Protection.	Consideration of impact by consent authority.	No	The areas on which the proposed modification will be developed do not contain any potential or core koala habitat.
Singleton Local Environment Plan 1996 (LEP).	Consideration of permissibility of development.	No	The areas on which the proposed modification will be developed lie entirely within the described land in schedule 1 of DA 309-11-2001-i.
Mining Act 1992.	Mining lease (ML).	No	The modification relates to activities entirely within ML 1533.
Protection of the Environment Operations Act 1997.	Environment Protection Licence (EPL).	No	No aspect of the proposed modification will require EPL 11879 to be amended.
Water Act 1912.	Part 5 groundwater licence for mine inflows from non-alluvial groundwater sources.	No	No aspect of the proposed modification will be capable of drawing water from non-alluvial groundwater sources and will not impact on mine inflows.
Water Management Act 2000 (WM Act).	Water Access Licence; Works, Use and Activity Approvals.	No	The proposed modification is not located on water front land and will not affect any water source regulated by a Water Sharing Plan in force under the WM Act 2000.

Legislation	Licence or approval	Required	Comment
National Parks and Wildlife Act 1974 (NPW Act).	Section 90 Aboriginal heritage impact permit (AHIP).	Yes	The proposed modification has been designed to avoid impacts on Aboriginal heritage as far as practically possible. Notwithstanding, any disturbance to Aboriginal objects will be managed in accordance with the conditions of AHIP 1131017, which relates to the area within which the development is proposed.
Native Vegetation Act 2003 (NV Act 2003).	Clearing permit.	No	The proposed modification will not require clearing of native vegetation.
Threatened Species Conservation Act 1995 (TSC Act).	Licence to harm threatened species, populations or ecological communities or damage habitat.	No	The proposed modification will not affect species prescribed in the schedules to the TSC Act.

3.3 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment P rotection & B iodiversity C onservation A ct 1999* requires the approval of the Commonwealth Minister for Sustainability, Environment, Water, Populations and Communities for all actions that will or are likely to have a significant impact on a matter of national environmental significance (MNES). The ACP was included within EPBC Referral 2001/524 in 2001 and was assessed and deemed not to have an impact on any MNES.

The proposed modification is within the area of EPBC Referral 2001/524 and will not result in any impact to MNES.

4 PROPOSED MODIFICATION

4.1 Summary of Proposed Modification

The proposed modification includes:

- Development and operation of an upcast ventilation shaft and fans, comprising:
  - A levelled pad area of approximately 60m x 75m.
  - A 5.5m diameter lined shaft, drilled to a depth of approximately 89m.
  - Two ventilation fans, ventilation ducting, fan evasés and associated infrastructure.
- Development and operation of two mine service drop holes, comprising:
  - A levelled pad area of approximately 20m x 20m, slightly larger during construction.
  - Two cased vertical boreholes (nominally up to 1m in diameter) for delivery of concrete and ballast directly to the underground mine.
- Development and operation of associated infrastructure and services, including an access track, electricity provision and sediment and erosion control structures.

The indicative site layout for the construction and operation of the proposed modification is shown in **Figure 2** and **Figure 3**, respectively.

4.2 Need for Proposed Modification

The modification is required to allow the safe continuation of the underground mine as approved in its original consent by augmenting mine ventilation arrangements. It also provides for significant improvement in delivering construction materials (concrete and ballast) to the underground workings.

4.2.1 Upcast Ventilation Shaft and Fans

The current mine ventilation arrangement comprises two (2) main surface-exhaust fans located at the mine entrance (in the highwall of the open cut pit) and a smaller (1m diameter) supplementary upcast shaft and fan at the southern end of longwall panel one (LW1) in the Pikes Gully Seam. Airflow capacities of the existing arrangement are sufficient to ventilate the Pikes Gully Seam (currently being mined) but will not be capable of providing adequate airflow to the deeper seams, as the mine develops.

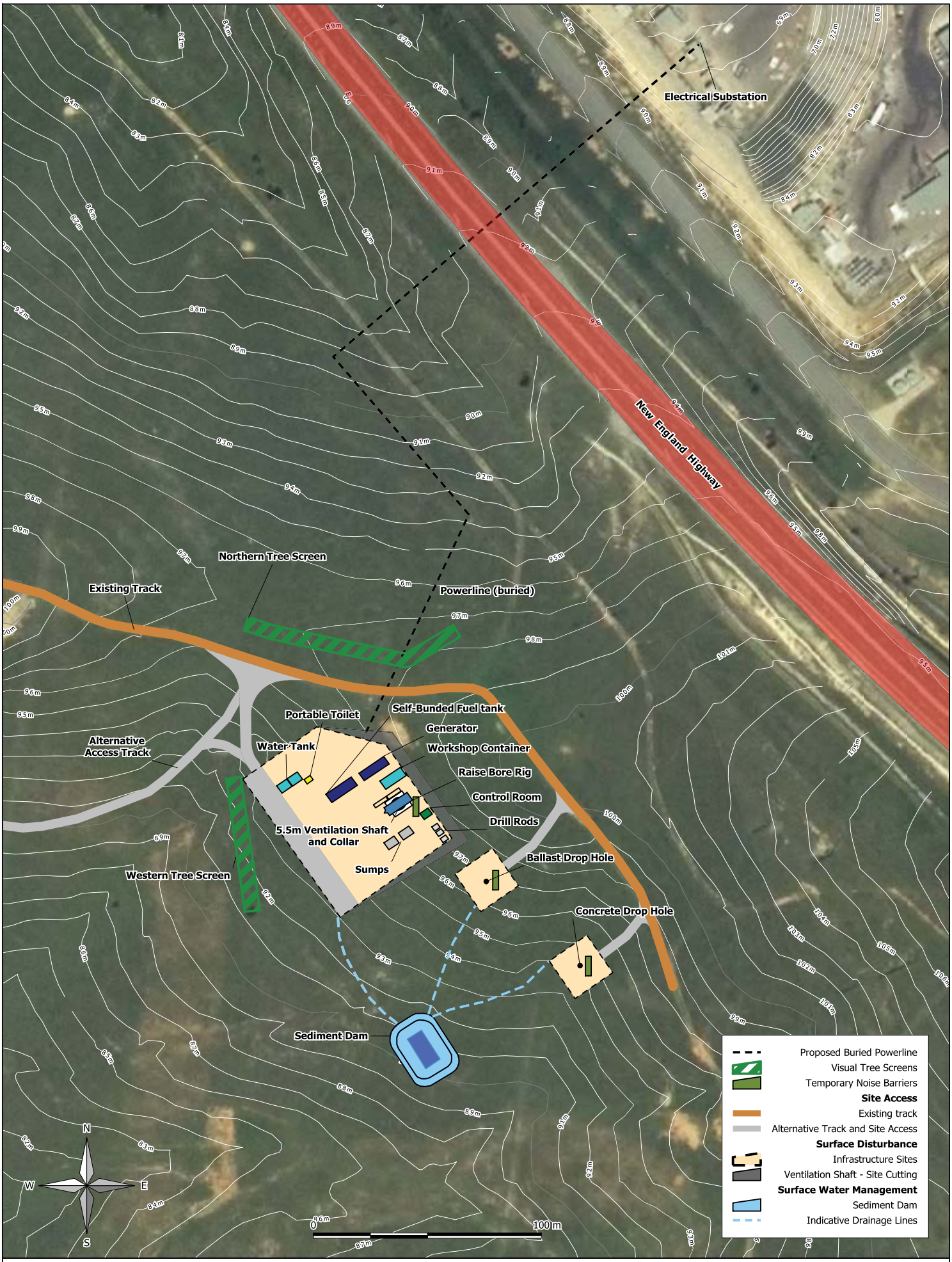
To meet the future ventilation requirements of the mine, ACOL proposes to construct a lined 5.5m upcast ventilation shaft with two surface mounted fans and associated infrastructure. The shaft will be constructed to the Upper Liddell Seam (the next deepest seam underlying the Pikes Gully Seam) and will be designed to provide efficient and adequate ventilation for the deeper seams, as the mine progresses.

4.2.2 Mine Service Drop Holes

At present, construction materials required for the underground operations are delivered via the main entry road. This creates vehicle congestion underground and is an inefficient method of delivering construction materials to the working area, particularly as the mine develops to deeper seams.

Consequently, ACOL is proposing to construct two (2) mine service drop holes to enable delivery of concrete and ballast directly to the Upper Liddell Seam underground workings from the surface. This will eliminate the need for delivery of materials by mine vehicles via the main underground entrance and inter-seam roadways, will reduce diesel fuel use with a subsequent reduction in Scope 1 greenhouse gas emissions and will provide increased operational efficiency.

The drop holes will be located in the vicinity of the proposed upcast ventilation shaft.



AshtonCoal

Construction Site Layout

Figure 2

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Date: 20/02/2012
Wells Environmental Services
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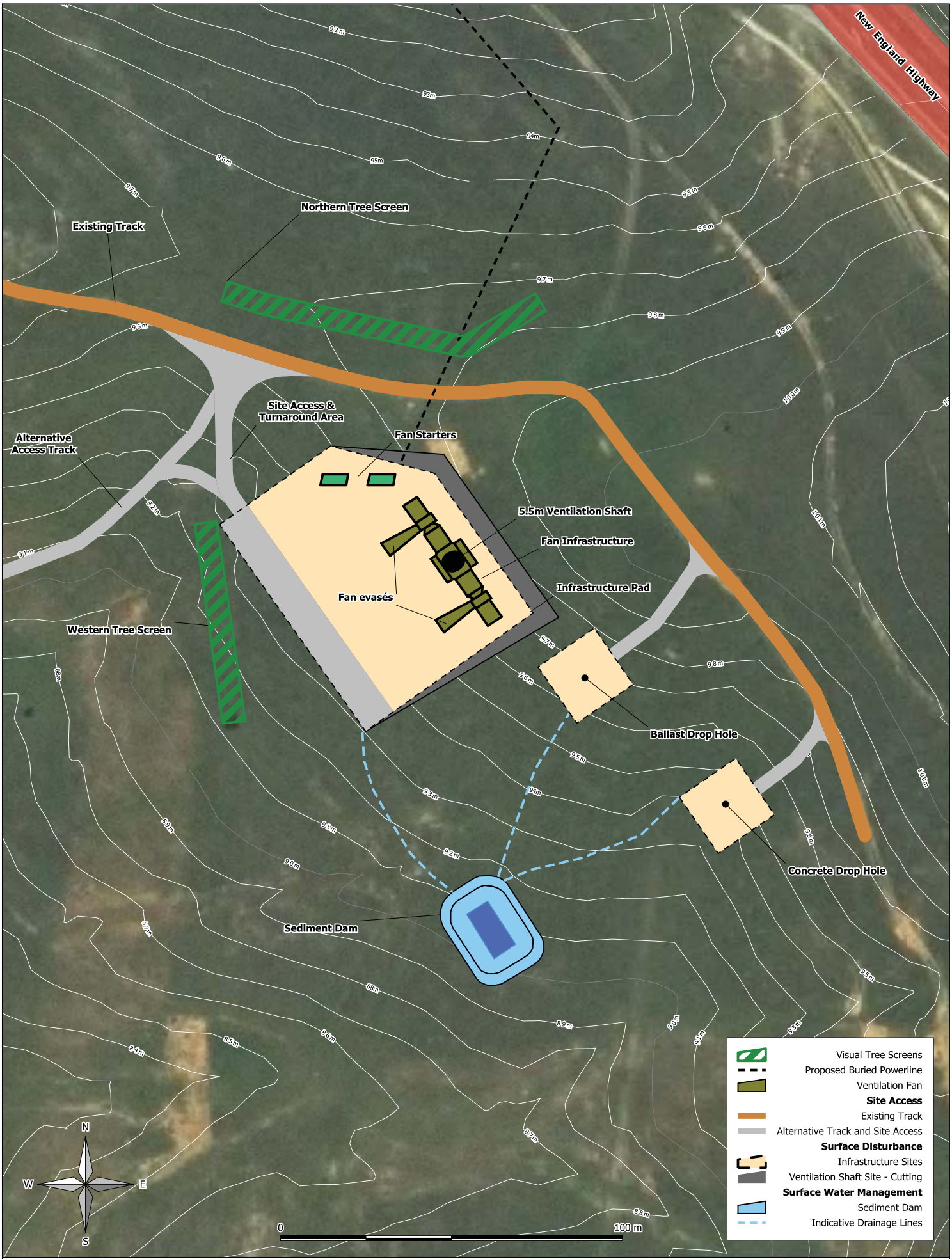

Operations Site Layout

Figure 3

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4.3 Description of Proposed Modification

4.3.1 Site Selection

The location of the proposed upcast ventilation shaft and mine service drop holes has been selected to ensure minimal impact to the environment, local community, visual amenity and to known items of Aboriginal heritage, while meeting geotechnical, mine layout constraints and operational needs (Figure 1).

The site faces southwest on the ridge slope overlooking the area of the underground mine (**Photograph 1**). The pad areas on which the ventilation shaft and drop holes will be developed will be recessed into the slope. This and the topography of the site will provide noise and visual screening to Camberwell residents as well as the majority of traffic on the New England Highway.

The site was previously cleared for grazing purposes.

Photograph 1: Proposed site (view facing east)

4.3.2 Ventilation Shaft and Fans

The upcast ventilation shaft will require the establishment of the following components:

- Infrastructure pad.
- 5.5m diameter shaft.
- Fan assembly and associated infrastructure.

A range of equipment will be required to construct the ventilation shaft and fan assembly, including a raise bore rig and support vehicles, a front end loader, excavators, a water cart (for dust suppression) and various other light and heavy vehicles. Approximately 10 construction workers will be required to construct the shaft and fans. Construction of the ventilation shaft and fans will create approximately 17 vehicle movements per day through the unnamed “Dairy Lane” intersection.

Construction will take approximately 26 weeks and will be carried out from 7am to 10pm Monday to Saturday and from 8am to 10pm on Sunday.

Site layout during construction is indicatively shown in Figure 2. The layout of the completed works is indicatively shown in Figure 3.

4.3.2.1 Infrastructure Pad

A level pad of approximately 60m x 75m will be established by cutting into the natural slope of the site. The cutting will be at the rear of the pad (northern side) and have a height of approximately 3.5m. This will assist in providing visual and acoustic screening to residents in Camberwell and New England Highway traffic. The removed soil and earth will be temporarily stockpiled and used in landscaping, post construction. A concrete base, approximately 8m x 8m, will be constructed within the pad to house the raise boring rig for shaft boring and form the ventilation shaft collar. The remaining pad area will be surfaced with a road base material (typically gravel) to assist drainage and provide stability for vehicles and infrastructure.

A 1.8m high perimeter fence will be constructed around the infrastructure pad to restrict unauthorised entry. Temporary lighting will be installed to provide safe evening working conditions. These will be positioned and focused to minimise visual impact on surrounding areas. Two (2) tree screens will be established, to the north and to the west of the site, to further shield the shaft and fan assembly from surrounding view-points.

All disturbed areas, not required for ongoing operation purposes, will be revegetated after construction of the ventilation shaft is complete. Surface water run-off from the site will be directed to the sediment dam.

4.3.2.2 Shaft Drilling

A temporary marquee will be installed over the raise bore to provide protection from the elements (**Photograph 2**). A workshop container and portable toilet will be installed for the duration of the drilling. Electrical power will be provided by two diesel powered generators, a 1 Megawatt (MW) and a 20,000 Kilowatt (kW) generator. Fuel deliveries will be required, once every two (2) days on average, with delivered fuel stored in two (2) self-bunded fuel tanks (up to 2,000L). Water required for drilling will be sourced from the supply at ACOL operations and held on site in temporary storage containers.

Photograph 2: Typical raise bore drilling rig and temporary marquee (source: ACOL)

The ventilation shaft will be drilled and lined using a raise bore rig and automated shaft lining equipment. Raise boring utilises access to the existing underground workings to bore a shaft vertically upwards to the surface. Raise boring is preferred over other shaft construction methods as it requires less surface disturbance, does not bring drill cuttings to the surface and generates lower

noise emissions then other large shaft drilling methods. A typical raised bore rig is shown in Photograph 2, above.

A pilot hole will be drilled to the Upper Liddell Seam underground workings (approximately 89m). A reaming head will then be attached and a 5.5m diameter shaft raise bored to the surface. Two (2) small temporary drill sumps will be constructed adjacent to the pad and raise bore to recirculate water during shaft boring. These will be filled and revegetated at the completion of drilling. Alternatively, portable above ground sumps may be used.

After the completion of drilling, the shaft will be lined to provide stability and improve airflow efficiency. This will require use of a remote shaft lining system, including use of a headframe and winches to lower an unmanned spraying rig into the shaft.

4.3.2.3 Surface Infrastructure – Fan Assembly

Ventilation fans are a common requirement for underground mines, with several examples within the landscape surrounding ACOL. **Photograph 3** shows a ventilation fan (with a vertically orientated evasé) located at the Ravensworth Underground Mine, as seen from the New England Highway.

Photograph 3: Ravensworth Underground Mine ventilation fan, vertically orientated venting (as seen from the New England Highway)

The proposed ventilation fan will include an evasé, which will be aligned horizontally, to cover the fans to increase fan efficiency and reduce fan noise. The fan assembly will also house a small control room for use during inspections and maintenance.

The fan assembly and supporting infrastructure will have a maximum height of 7m, approximately half of which will be set below ground level at the back of the pad. The fan assembly will be partially assembled offsite, then transported to site for final installation. The colour of the fan assembly has been chosen to be concordant with the surrounding environment as far as practicable.

Permanent power will be provided to the site from an electrical substation located near the main ACP offices via a buried cable to be established passing underneath the New England Highway (refer to Figure 2). Where under boring of the New England Highway is required, it will be done in consultation with the NSW Roads and Maritime Services (RMS) and will not require highway traffic disruption.

The fans will be primarily controlled via remote control from the ACOL main site. A manual control room will be used during maintenance and as a secondary point of control during failure of the remote system.

Indicative specifications for the proposed ventilation fan are included as **Appendix 1**.

The fans will operate continuously for the remaining life of the underground mine (up to 14 years), except during maintenance periods. **Photograph 4** displays a similar ventilation fan, to that proposed, located at the Mandalong Mine.

Photograph 4: Similar mine ventilation fan at the Mandalong Mine (as seen from the F3 Sydney – Newcastle Freeway)

4.3.3 Mine Service Drop Holes

Each mine service drop hole will require the establishment of the following components:

- Infrastructure pad.
- Large diameter borehole, nominally up to 1m in diameter.
- Material stockpile, where relevant.

A range of equipment will be required to construct the drop holes, including a large diameter drilling rig and support vehicles, a front end loader (for site preparation), a water cart (for dust suppression) and various other light and heavy vehicles. A crew of up to 10 construction workers will be required.

The drilling and completion of each hole will take up to 20 days to complete. Drilling will be carried out during daylight hours, 7am to 6pm Monday to Saturday and 8am to 6pm Sunday. Approximately eight (8) vehicle movements per day will be created during construction of the mine service drop holes. Figure 1 and Figure 2 shows the location of the mine service drop holes.

4.3.3.1 Infrastructure Pad

A level pad of approximately 30m x 30m will be established prior to the drilling of each drop hole. This will be reduced to an area of about 20m x 20m for each hole following completion of the drilling. A concrete base, approximately 4m x 4m, will be constructed within the pad and centred on the drop hole. Remaining pad areas will be surfaced with a road base material (typically gravel) to assist drainage and provide stability for vehicles during wet weather.

Disturbed areas, not required for ongoing operation purposes, will be revegetated after construction of the drop holes is complete. Surface water run-off will be diverted around each pad and directed to the sediment dam.

A 1.8m high security fence will be constructed around the perimeter of each pad to restrict unauthorised access. Surface water run-off from the site will be directed to the sediment dam.

4.3.3.2 Drilling

The vertical drop holes will be established using a large diameter (up to 1m diameter) mobile drilling rig. The holes will be drilled from the surface to the Upper Liddell Seam, a depth of about 89m.

A small sump will be constructed adjacent to each pad during the drilling stage. These will be filled and revegetated at the completion of drilling. (Alternatively, portable above ground sumps may be used). Drill cuttings will be incorporated into rehabilitation works, or transferred to the open cut pit for disposal in the rejects emplacement area, where appropriate.

Water required for drilling will be sourced from the supply at ACOL operations and held on site in temporary storage containers. The completed holes will be cased with steel casing.

4.3.3.3 Ballast Drop Hole

The ballast drop hole will be used to deliver ballast directly to the underground workings. Ballast (gravel or a larger stone material) will generally be delivered to site by a standard tipper truck (up to 30t). The truck will reverse up to the drop hole and dump a load of ballast directly over the hole. Ballast will be gravity-fed down into the underground workings through a grate.

The intention is to completely fill the drop hole with ballast leaving a small stockpile at the top and bottom of the hole. The size of the surface stockpile will be generally equivalent to about one (1) truckload, the stockpile will be covered with a tarpaulin to minimise rainfall entering the drop hole. A cover will be secured over the drop hole when it is not in use. The indicative design of the ballast drop hole is shown in **Figure 4**.

Deliveries will occur during daylight hours when there is demand from the underground operation. It is estimated that deliveries will be required up to two (2) times per week. Occasionally a small front end loader (bobcat or similar) will be required to reform the stockpile over the hole.

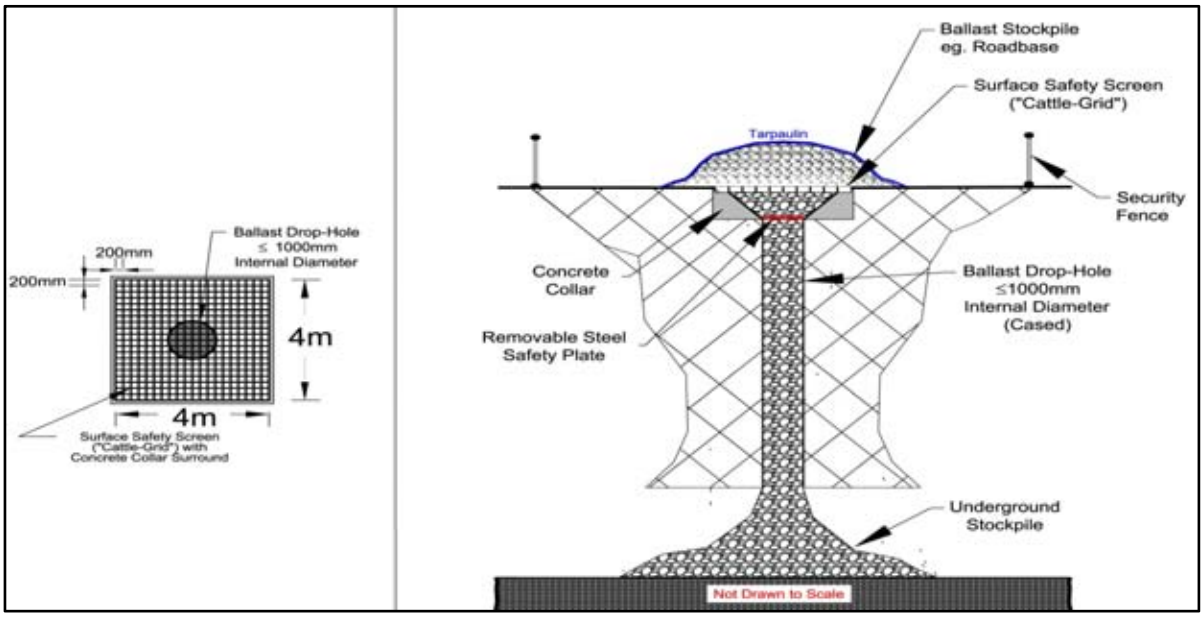

Figure 4: Conceptual ballast drop hole design (source: ACOL)

4.3.3.4 Concrete Drop Hole

The concrete drop hole will be constructed consistently with the ballast drop hole and will be used to deliver concrete directly to the underground workings. Mixed concrete will be delivered to site by conventional concrete trucks. Trucks will reverse up to the drop hole and directly feed concrete down the drop hole to the underground workings. A cover will be secured over the concrete drop hole when it is not in use.

Concrete will be required intermittently by the underground mine. On average, this will require concrete deliveries once every two (2) weeks, with a maximum of fifteen truck deliveries (up to 30 vehicle movements per day) required on each occasion. Deliveries will be limited to daytime hours.

4.3.4 Site Access

Access to the ventilation shaft and drop holes will be via the New England Highway and the unnamed property intersection locally referred to as “Dairy Lane”. Vehicles will utilise an existing track to the site. The access route is shown on Figure 2.

A minor upgrade and extension to the existing farm access track will be required to facilitate all-weather access to the vent shaft and each of the drop holes. An alternative track is also proposed, should access via the existing track not be feasible.

4.3.5 Sediment Dam

Rainfall runoff from disturbed areas will be minor, as the total area (including access tracks) comprises approximately 0.75ha. An appropriately sized sediment dam and catch drains will be constructed downslope of the disturbance areas, as shown in Figure 2.

4.3.6 Decommissioning and Rehabilitation

All disturbed sites, including access tracks, will be incorporated into the ACOL mining operations plan (MOP) and decommissioned upon the completion of underground mining. All infrastructure will be removed from the site and shafts will be filled and sealed in accordance with DRE guidelines. Disturbed areas will be rehabilitated to achieve a landform consistent with that prior to disturbance.

5 IMPACT ASSESSMENT

5.1 Environmental Risk Assessment

An Environmental Risk Assessment was facilitated by SPS on the 1 June, 2011. The results of the risk assessment are included as **Appendix 2**.

The risk assessment was used to help identify key environmental issues requiring further consideration in the assessment of the proposed modification.

The key issues were identified as:

- Noise.
- Air quality and greenhouse gas.
- Aboriginal heritage.
- Terrestrial ecology.
- Traffic.
- Visual amenity.

A summary of the assessment outcomes for each of these issues is provided below.

5.2 Noise

Spectrum assessed the potential noise impacts of the construction and operation of the ventilation shaft and mine service drop holes. This involved modelling the potential noise emissions at the nearest private residence (1 km to the northeast in Camberwell) under adverse meteorological conditions for relevant construction and operational sound power levels. Spectrum's report is included as **Appendix 3**.

The noise assessment considered four (4) separate scenarios for construction and operation of the required infrastructure. A summary of the highest (worst case) modelled results is provided in **Table 3**, which also compares modelled results with ACOL's existing noise impact assessment criteria. The results show the potential for a moderate (+2dBA) exceedance of noise impact assessment criteria during the drilling of the drop holes and the pilot hole for the ventilation shaft under worse case noise enhancing conditions (i.e. a westerly wind).

To mitigate this, Spectrum has recommended use of a temporary noise barrier during drilling of the holes. This can be achieved by strategically locating construction site sheds or drill storage shipping containers adjacent to and upwind of the drill rig (see Figure 2).

The re-modelled noise level (including the acoustic screen) is also shown in **Table 3** and is well below the noise impact assessment criteria.

The modelled results for all other works are well below the noise impact assessment criteria. As such, no other mitigation measures are required.

Spectrum concluded that with appropriate mitigation measures there will be no increase in mine noise levels and no potential for noise disturbance at any private residence during the construction or operational stages of the project.

Table 3: Modelled noise levels at private receivers

Scenario	Highest modelled receiver	With mitigation measures (noise barrier)	Existing ACOL Criteria
Construction – ventilation shaft pilot hole and drop holes drilling (west wind)	40	30	38 (daytime)
Construction - ventilation shaft raise bore drilling (west wind)	31	N/A	38 (daytime)
Operation - ventilation fans (west wind)	30	N/A	36 (night)
Operation -ventilation fans (inversion* at 4.7 degrees Celsius (^{O}C) per 100m)	21	N/A	36 (night)

** Based on the measured inversion strength at the ACOL meteorological station*

5.3 Air Quality and Greenhouse Gas

PAE Holmes assessed the dust and greenhouse gas (GHG) impacts that would potentially be caused by the construction and operation of the ventilation shaft and mine service drop holes. The full report is included as **Appendix 4**.

Construction of the ventilation shaft will occur on a site approximately 1km from the nearest privately owned residence. Dust generating activities will be short lived and limited to surface disturbance, including access of light and heavy vehicles and drilling the shaft pilot hole and drop holes, as raise boring of the shaft will occur from within the underground workings. PAE Holmes has recommended the following measures to minimise dust emissions:

- Minimise the extent of disturbance areas to the least practicable.
- Restrict vehicle speeds and ensure all vehicles use designated tracks.
- Make use of regular and frequent watering on access tracks and exposed construction areas, particularly during hot and windy conditions.

These recommendations will be adopted by ACOL.

The purpose of the ventilation shaft is to improve the efficiency of the existing ventilation system by drawing additional fresh air into the mine and to maintain safe working conditions in the underground mine. Carbon dioxide (CO_2) and methane (CH_4) are released as a direct result of underground mining. These gases can concentrate in the underground workings causing a significant safety hazard and slowing the progression of the underground mine. ACOL is currently preparing a separate modification application for the development of additional infrastructure to enable appropriate management of gas from the underground mine.

The operation of the ventilation shaft will not cause an increase in the overall GHG emissions from the underground mine. If the ventilation shaft is not developed an equal amount of GHG emissions will occur through the existing ventilation system, however underground mining progression would be significantly delayed or even halted due to the inability of the current arrangement to adequately ventilate the deeper mine workings.

A small increase in GHG emissions will occur from additional diesel consumption (generators) during the construction phase of the development, however this increase is considered insignificant in the context of the mining operation.

The mine service drop holes will provide for more efficient delivery of materials to the underground workings, reducing overall vehicle travel distance, fuel consumption and consequently GHG emissions.

5.4 Aboriginal Heritage

Insite assessed the potential impacts to items of Aboriginal heritage caused by the project. Insite's report is included as **Appendix 5**.The location of the ventilation shaft, drop holes and access track were selected and refined to avoid all known locations of Aboriginal artefacts as far as practically possible. Notwithstanding, the site of the proposed development is within the area of a previously recorded Aboriginal site (AHIMS 37-3-0537).

ACOL provided written correspondence on the Project to registered Aboriginal stakeholder groups on the 2nd and 3rd November, 2011. Correspondence included an information package on the proposed development and invitations to visit the site on either the 4th or 7th November, 2011.

The area has been included in prior Archaeological surveys carried out to assess mine subsidence impacts and the development of infrastructure associated with ACOL's SEOC Project application. Notwithstanding, a specific foot survey over the proposed disturbance area and access track(s) was carried out in conjunction with Aboriginal stakeholders on the 6th June, 2011. An additional survey was conducted over the alternative access track on the 6th July, 2011. The surveys identified five (5) additional isolated finds and two (2) artefact scatters within the existing farm access track. An additional artefact scatter was identified outside of the disturbance footprint, however it was noted that visibility was low (0%-20%) in all other areas. Insite concluded that the potential for additional Aboriginal objects within the disturbance area was highly likely and recommended the following measures to manage and mitigate impacts:

- The proposed alternate site access track (option 2) should not be constructed without further consultation with the Aboriginal Stakeholders, as it is considered it has higher potential to impact on additional unknown objects associated with the registered Aboriginal site AHIMS 37-3-0537.
- A salvage methodology should be developed in accordance with the conditions of AHIP 1131017 and the consultation outcomes with Aboriginal stakeholders carried out for the archaeological assessment.
- A perimeter barricade should be placed around known objects located in proximity to the proposed works to avoid unintentional impacts on these objects during construction and operation of the proposal.

Since these investigations and Insite's report were completed, the NSW Office of Environment and Heritage (OEH) issued Aboriginal Heritage Impact Permit (AHIP) 113107 over land encompassing the proposed development. AHIP 113107 includes provisions for the management of Aboriginal objects for works associated with (among others):

- *"Activities and establishment of infrastructure to provide for the safe ongoing operation of the mine"*; and
- *"Upgrade and maintenance of existing access and formation of new access tracks"*.

It should be noted that certain works such as track maintenance are required to support other ongoing aspects of the mining operation and that since gaining the AHIP ACOL has salvaged artefacts along the existing track proposed to access the proposed development. This work is unrelated to the modification, but was necessary to enable ACOL to maintain access to other parts of its mining lease and to fulfil environmental and land management requirements.

Notwithstanding, ACOL commits to implementing Insite's recommendations to ensure impacts to Aboriginal objects are either avoided or appropriately managed. Further, ACOL's Aboriginal heritage management and detailed site disturbance procedures will be maintained as a mandatory component of site inductions for all workers involved in the construction and operation of the proposed development.

5.5 Terrestrial Ecology

PEA assessed the potential impact of the construction and operation of the ventilation shaft and associated infrastructure on terrestrial ecology. PEA's report is included as **Appendix 6**.

No further survey was required as extensive survey had been completed for previous projects. A review of prior surveys was undertaken to assess the ecological value of the site.

Construction of the ventilation shaft pad and access track upgrade will result in a surface disturbance of approximately 0.75ha of dry pasture, previously cleared for livestock grazing. Construction will not require the clearing of any treed vegetation and will have no impact on threatened species. The loss of, or impact to, existing ecology is minor.

To ensure there are no inadvertent impacts to terrestrial ecology, PEA has recommended the following measures:

- Restricting site access to existing and proposed access tracks and disturbance areas.
- Ensuring construction activities are carried out in accordance with ACOL's existing approved environmental management plans (i.e., soil stripping, flora and fauna and land management plans) and procedures.
- Restrict vehicle speeds and ensure all vehicles use designated tracks.

These recommendations will be adopted by ACOL.

5.6 Traffic and Transport

SKM assessed the impact of the additional traffic required during construction and operation of the proposal. SKM's report is included as **Appendix 7**.

Access from the New England Highway will be via the unnamed "Dairy Lane" property access intersection.

The proposal will add an estimated 25 light and heavy vehicle movements per day to existing New England Highway traffic volumes during the construction phase of the proposal. Currently the New England Highway carries about 11,000 vehicles per day. An increase of 25 daily vehicle movements (assuming construction of the ventilation shaft and mine service drop holes occurs concurrently) will have negligible effect on existing highway conditions and road safety.

Traffic increase during operation of the ventilation shaft will be limited to an average of one (1) vehicle movement per day for general inspections and maintenance. Deliveries to the mine service drop holes will occur on a campaign basis with up to about 30 vehicle movements (i.e., fifteen trucks) a day once every two weeks required for concrete delivery and four vehicle movements (i.e., two trucks) a week for ballast delivery. However the expected average will be much lower than this.

Should construction occur concurrently with other works at ACOL (e.g. the Bowmans Creek Project), the traffic mitigation measures for those projects will be applied consistently. In the event construction does not occur concurrently, SKM has recommended the following actions be taken to ensure the potential impacts to traffic are minimised:

- The unnamed 'Dairy Lane' property access intersection should be operated as a left in - left out intersection.
- Temporary 'Trucks Turning' caution signs should be installed in both directions on the New England Highway approximately 200 to 300m in advance of the unnamed 'Dairy Lane' intersection during construction works.

These recommendations will be adopted by ACOL, where appropriate.

5.7 Visual Amenity

AECOM assessed the impacts of the proposed surface infrastructure (during construction and operation of the shaft) on the visual amenity of the area. AECOM's report is included as **Appendix 8**.

The visual impact was assessed from three locations considered the most accessible public vantage points. The overall visual impact was determined to be very low, with the main impact potentially experienced by vehicles travelling south on the New England Highway during construction, approximately 1km northwest of the site. However, visual exposure would be limited to a short duration (both in terms of driver pass-by and construction duration).

AECOM recommended the following mitigation measures to minimise the potential for visual impact:

- The provision of screening vegetation to the northwest and south of the proposed infrastructure.
- The selection of visually recessive coloured materials for the fan ducting and evasés, such as *Colourbond 'Sandbank'* or *'Jasper'* shades.

The above recommendations will be adopted by ACOL.

Given the very low visual impact of the proposal, no other mitigation measures are required.

5.8 Surface Water and Soils

The potential impacts to soils and surface water were considered minor and capable of being adequately managed under existing site protocols. A specialist report was not considered warranted.

The management of potential impacts upon soils and surface water is discussed below:

5.8.1 Erosion and Sedimentation

Some disturbance of soils will be required to enable construction of the shaft and associated infrastructure. Topsoil will be temporarily stockpiled at the site for use in landscaping the disturbed areas after the completion of construction activities.

Erosion and soil loss during construction will be managed and mitigated through the use of ACOL's existing erosion and sediment control measures, including:

- Diverting clean water runoff around construction areas.
- Installing sediment fencing, hay bales or other suitable controls down slope of disturbed areas.
- Surfacing pad areas and access tracks with an appropriate road base material.
- Stabilising stockpiles that will be left for any length of time with jute mesh or grass cover.
- Regular inspection and monitoring.
- Immediately remediating erosion.
- Promptly rehabilitating disturbed areas no longer required for ongoing operations.

With the implementation of the above controls, no significant impacts to soils are expected.

5.8.2 Surface Water

The site is well removed from surrounding natural watercourses and the construction and operation of the proposal will not impact on these drainage lines.

A clean water diversion will be constructed around the site to minimise rainfall runoff from the disturbance areas. A sediment dam and catchbank will act as the main control measures for surface water runoff. These will be appropriately sized to manage potential runoff volumes in accordance with relevant guidelines.

Disturbed areas not required for continued operation will be landscaped and vegetated as soon as practical, following disturbance.

A self-bunded diesel storage tank will be used to reduce the risk of fuel spillage and a spill containment kit installed at the site during construction for use in the event of a spill or emergency.

5.9 Waste

ACOL maintains an approved waste management plan for its operations. All waste generated by the proposal will be recycled or disposed of in accordance with this plan.

6 ENVIRONMENTAL MANAGEMENT CONTROLS

In conjunction to its existing approved Environmental Management Plans (EMPs) and procedures, ACOL will implement the following additional management measures (outlined in **Table 4**) to avoid, minimise and manage the potential impacts associated with the proposed modification.

Table 4: Environmental management controls

Item	Action
1	**Aboriginal Heritage**
1a	Locations of the infrastructure, access track and sediment dam have been designed to avoid known Aboriginal heritage sites, wherever practicable.
1b	Infrastructure locations have been surveyed for Aboriginal artefacts prior to disturbance. Where Aboriginal artefacts are identified these will either be salvaged or relocated in in accordance with the conditions of AHIP 1131017.
1c	A perimeter barricade will be placed around known objects located in proximity to the proposed works to avoid unintentional impacts during construction and operation.
1d	Site Inductions will include identification of Aboriginal heritage exclusion areas and actions to be undertaken where additional Aboriginal artefacts are identified, in accordance with ACOL's existing Aboriginal heritage management protocols.
2	**Noise**
2a	A temporary noise barrier (e.g. site sheds or shipping container) will be installed east of the site during pilot hole and drop hole drilling.
2b	Noise monitoring will be undertaken during construction to ensure compliance with the relevant criteria.
3	**Air Quality**
3a	A water cart will be used to suppress dust on access tracks and on disturbed areas, where required.
3b	Disturbed areas not required for ongoing operations will be promptly rehabilitated.
4	**Terrestrial Ecology**
4a	Ground disturbance will be minimised as far as practicable.
4b	Site access will be restricted to existing and proposed access tracks.
4c	Site Inductions will include identification of designated site access routes and correct driving behaviour.
5	**Soils, Erosion Control and Surface Water**
5a	Industry standard sediment control measures will be implemented prior to ground disturbance.
5b	Clean water diversions will be implemented around the site.
5c	An appropriately sized sediment dam will be constructed to capture surface water runoff from disturbed areas.
5d	Disturbed areas will be revegetated as soon as possible.

6	**Traffic**
6a	Vehicle access, for construction and operation of this project, will be restricted to designated site access routes. ACOL and construction employee access to “Dairy Lane” will be restricted to left in and left out, where required.
6b	Temporary “trucks turning” signs will be installed on the New England Highway in both directions, 200 to 300m in advance of the intersection, during construction.
7	**Visuals**
7a	Screening vegetation will be used to limit visual exposure to the northwest and south.
7b	The colour of the ventilation fan infrastructure will be selected so as to be visually recessive with the surrounding landscape.
8	**Waste**
8a	Construction waste will be recycled or disposed of in accordance with the existing ACOL approved Waste Management Plan.

7 JUSTIFICATION AND CONCLUSION

ACOL propose to modify DA 309-11-2001-i pursuant to the provisions of clause 12 of Schedule 6A of the EP&A Act to allow the installation of a 5.5m diameter upcast ventilation shaft and fans, two mine service drop holes and associated infrastructure. The modification will allow the safe and efficient continuation of the approved underground mine. The proposed upcast ventilation shaft and fans will augment the existing ventilation arrangements for the mine and will ensure adequate ventilation is provided as underground workings in deeper seams are developed. The proposed mine service drop holes will ensure the efficient delivery of construction materials (concrete and ballast) to the underground workings.

The proposed modification will not alter the size of the approved ACP, the operating hours, the mining methods, the rate of approved coal extraction and production, or the method and frequency of off-site coal transport to that already approved by DA 309-11-2001-i. The proposed modification will not radically alter or transform the approved project, and the ACP will be substantially the same development as originally approved by the Minister. Further, there will be no increase in offsite environmental impacts as a result of the modification.

The proposed development will operate consistently with ACOL's approved Environmental Management Plans and within the limits of existing environmental impact criteria, as prescribed and currently approved within DA 309-11-2001-i.

8 REFERENCES

- Evans and Peck (2010) “Bowmans Creek Diversion Environmental Assessment”, prepared by Evans and Peck Pty Ltd.
- HLA (2001). “White Mining Limited Ashton Coal Project Environmental Impact Statement”, prepared by HLA-Envirosciences Pty Limited.
- NSW Department of Mineral Resources (1997) “Borehole Sealing Requirements On Land: Coal Exploration”.
- NSW Department of Primary Industries (2006) “Guidelines to the Mining, Rehabilitation and Environmental Management Process”.
- Wells Environmental Services (2009) “South East Open Cut Project and Modification to the Existing ACP Consent”, prepared by Wells Environmental Services Pty Limited.
- Wells Environmental Services (2011) “Underground Mine Interim Gas Drainage, Open Cut Hebden Seam Recovery, Condition 3.14 (Schedule 2) Amendment”