



Ashton Coal Project

ENVIRONMENTAL ASSESSMENT

FOR THE MODIFICATION OF DA 309-11-201-i (MOD 7)

COMPRISING

UNDERGROUND MINE INTERIM GAS DRAINAGE
OPEN CUT HEBDEN SEAM RECOVERY
CONDITION 3.14 (SCHEDULE 2) AMENDMENT

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1 INTRODUCTION

This environmental assessment (EA) report constitutes an application made pursuant to Section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act), seeking a minor modification to development consent DA 309-11-2001-i (MOD 7) for the existing Ashton Coal Project (ACP). The ACP is located in the vicinity of Camberwell in the Singleton local government area, in the Hunter Valley, NSW (Figure 1), and comprises both open cut and underground mining operations.

The proposed development consent modification involves:

- Construction and operation of approximately fifteen gas venting surface wells for the underground mine.
- Open cut recovery of about 100,000 tonnes (t) of run-of-mine (ROM) coal from the Hebden Seam, about 13 m beneath the floor of the existing open cut mine.
- Amending the wording of condition 3.14 to schedule 2 of the development consent.

The modification is required to enable:

- Continued safe operation of the existing underground mine.
- Continued employment for up to 80 open cut mine employees, while a major project application for a new open cut mine (adjacent to the existing ACP) is being determined.
- Development of underground first workings in accordance with the approved mine plan, without the need for additional regulatory approval.

These development consent amendments will not alter the overall disturbance area of the ACP, or the method of open cut or underground mining, and 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.

The EA has been prepared with 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 (PAE), Geotech Solutions Pty Ltd (Geotech) and RPSAquaterra Pty Ltd (RPSAquaterra).

2 BACKGROUND

2.1 The Proponent

Ashton Coal Operations Pty Limited is an unincorporated joint venture (JV) company comprising the following ownership:

- White Mining (NSW) Pty Limited (60%)
- Austral-Asia Coal Holdings Pty Ltd (30%)
- ICRA Ashton (10%)

White Mining (NSW) Limited is a fully owned subsidiary of Yancoal Australia Ltd (Yancoal).

Yancoal is a wholly owned subsidiary of Yanzhou Coal Mining Company Limited. Yancoal owns and operates the Austar Coal Mine and is the owner and operator of Moolarben Coal Mines, having an 80% share in the Moolarben Coal Project. Yancoal is also one of six equity partners in the Newcastle Coal Infrastructure Group (NCIG), having a 15.4% share in the group.

Yancoal is the managing operator of the ACP.

Ashton Coal Operations Pty Limited 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. This approved the development of an open cut and underground mine; coal handling and preparation plant (CHPP); 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 six separate occasions:

- DA 309-11-2001-i MOD 1, allowing for the Environment Protection Authority (EPA) to specify noise criteria in table 5. 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 (PG) Seam of the underground mine, an increase in underground mine production (from 2.95 to 3.2 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, throughput of ROM coal handling, processing and product coal rail transport and the integration of the SEOC Project (when approved) with the ACP. The modification is currently under consideration by the Department of Planning (DoP).
- 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.

The ACP is approved to produce up to 5.45 million tonnes per annum (Mtpa) 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, sharing agreement with neighbouring mines for excess mine water from, potable water collected from roof tops, and imported water 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 <i>National Parks And Wildlife Act 1974</i> for 65.66 ha of land known as the "Southern Conservation Area". The agreement recognises underground mining may disturb the surface and require rehabilitation; and ongoing vegetation management within powerline easements.
Mine access	Off Glennies Creek Road.
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	386 full time employees

In addition, in March 2009, ACOL lodged a major project application (MP 08_0182) for the development and operation of the South East Open Cut (SEOC) Project (Wells, 2009a). The SEOC is a replacement to the current North East Open (NEOC), which is in the final stage of open cut coal extraction. The SEOC Project is currently under consideration by the DoP.

2.3 Location and Setting

The ACP is situated 14 km northwest of Singleton, adjacent to and west of the village of Camberwell, in the Hunter Valley, NSW (Figure 1).

The open cut mine (NEOC) is constrained 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 and village of Camberwell. The underground mine is constrained 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 infrastructure (New England Highway, Main Northern Railway, 66 and 132 kV powerlines and optic fibre telecommunications cable) and human settlement. There are 7 privately-owned residences (one of which is uninhabitable) and 37 ACOL-owned residences within the village of Camberwell. There are also a small number of rural residences on the larger agricultural properties in surrounding areas.

The closest private residence to open cut mining activities, including the proposed Hebden Seam extraction area, is within the village of Camberwell located about 600 m from the mine. The closest private residence to the gas well development area is a rural residence located about 2 km from the site.

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 development consent application and in schedule 1 to DA 309-11-2001-i.

2.5 Stakeholder Consultation

ACOL has discussed the proposed development consent amendments with its Community Consultative Committee, Industry & Investment NSW (I&I) and the DoP. In addition, it has discussed the need for and design of gas drainage wells with Macquarie Generation, which owns part of the land on which four of the wells will be established.

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).

According to Clause 8J(8)(b) of the *Environmental Planning and Assessment Regulations 2000*:

“For the purposes only of modification, the following development consents are taken to be approvals under Part 3A of the Act and section 75W of the Act applies to any modification of such a consent:

(c) a development consent granted by the Minister under Part 4 of the Act (relating to State significant development) before 1 August 2005....

The development consent, if so modified, does not become an approval under Part 3A of the Act”

Ashton Coal Operation Pty Limited is seeking approval to modify development consent DA 309-11-2001-i pursuant to section 75W (of Part 3A) of the EP&A Act, for the development consent amendments described in Section 4.

In addition, ACOL has provided a political donations disclosure statement as part of the modification application, 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
<i>State Environmental Planning Policy (SEPP) No 44 – Koala Habitat Protection.</i>	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.
<i>Singleton Local Environment Plan 1996 (LEP).</i>	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.
<i>Mining Act 1992.</i>	Mining lease (ML).	No	The modification relates to activities entirely within existing ACOL held ML 1533.
<i>Protection of the Environment Operations Act 1997.</i>	Environment Protection Licence (EPL).	No	No aspect of the proposed modification will require EPL 11879 to be amended.

Legislation	Licence or approval	Required	Comment
<i>Water Act 1912.</i>	Part 5 groundwater licence for mine inflows from non-alluvial aquifer sources.	No	The proposed modification to open cut operations (Hebden Seam recovery) will marginally increase groundwater inflow into the pit in the short-term. ACOL holds mine dewatering licence 20BL1699508 with an entitlement of 100ML. This is more than adequate to account for a marginal increase in open cut groundwater inflows.
<i>Water Management Act 2000 (WM Act).</i>	Water Access Licence; Works, Use and Activity Approvals.	No	The proposed modification will not affect any water source regulated by a Water Sharing Plan in force under the WM Act. The proposed gas drainage wells will not be located on water front land. The proposed gas drainage wells will not be capable of drawing water. Notwithstanding, borehole details will be provided to NOW for inclusion in its statewide borehole database.
<i>National Parks and Wildlife Act 1974 (NPW Act).</i>	Section 90 Aboriginal heritage impact permit (AHIP).	Yes	The proposed modification has been designed to avoid impacts on Aboriginal heritage. Notwithstanding, where Aboriginal artefacts may be uncovered in the course of carrying out the modification, ACOL will either relocate the disturbance works (gas well or access track) or salvage the artefacts under an appropriate AHIP.
<i>Native Vegetation Act 2003 (NV Act).</i>	Clearing permit.	No	The proposed modification will not require clearing of native vegetation.
<i>Threatened Species Conservation Act 1995 (TSC Act).</i>	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 Commonwealth Legislation

3.3.1 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act) requires the approval of the Commonwealth Environment Minister 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 comprises:

- Construction and operation of approximately fifteen suction pump and free venting gas surface wells to enable continued safe operation of the existing ACP underground mine.
- Open cut recovery of about 100,000 tonnes of ROM coal from the Hebden Seam beneath the floor of the existing NEOC pit to provide short-term continued employment for mine employees, while the SEOC Project application is being determined.
- Amending the wording of condition 3.14 to schedule 2 of the development consent, to enable development of underground first workings without the need for further regulatory approval.

These development consent amendments will not increase the size of the approved ACP or change the methods of mining, and there will be no increase in the rate of coal extraction, production or frequency of off-site coal transport to that already approved by DA 309-11-2001-i.

4.2 Need for Proposed Modification

4.2.1 Underground Mine Interim Gas Drainage

ACOL is required to manage gas levels within its underground mine to be within safe operating levels.

Geological investigations prior to development of the ACP determined that the coal seams proposed for underground mining contained low to moderate gas yields and that the gas content in the shallower seams would not form a constraint to mining. However, a gas management plan would be required to be implemented prior to mining the deeper coal seams (HLA, 2001).

Higher than expected coal seam gas levels have now been encountered in the underground mine, which requires implementation of measures to provide safe operating conditions. As an immediate response, three gas drainage wells were installed into the Pikes Gully (PG) Seam longwall panel (LW) 6A, in 2010. The development of these wells was carried out under the exempt development provisions of *State Environmental Planning Policy Mining, Petroleum Production and Extractive Industries 2007* (Mining SEPP). The gas wells have been effective in reducing the concentration of hazardous gases within operational areas of the underground mine to safe operating levels.

ACOL is now proposing to install approximately fifteen additional gas drainage wells into PG Seam LW 6B, 7A, 7B and 8. The wells will be similar in design to that installed into LW 6A. This will ensure safe operating conditions are maintained during the mining of the remaining PG Seam longwall panels.

Rather than developing the additional wells under the exempt development provisions of the Mining SEPP, ACOI considers it more prudent to include the wells in a development consent modification application, which will enable the assessment of the cumulative effect of constructing and operating the wells.

The development of the additional gas drainage wells is an interim measure to enable continued safe operation of the mine in the short-term. A more substantial gas drainage network will be designed and implemented prior to requiring gas drainage in the Upper Liddell Seam (ULD Seam). This will include consideration of gas capture and flaring or potential beneficial use, and will be the subject of a future modification to DA 309-11-2001-i. The gas wells developed into the PG Seam may form part of this future gas drainage network.

4.2.2 Open Cut Hebden Seam Recovery

The existing ACP open cut mine (NEOC, comprising the Arties and Barrett pits) was designed and approved to recover coal down to the base of the Barrett Seam. This was the limit of stripping ratios that could be economically supported by coal prices at that time, notwithstanding that coal resources continue at depth below the designed pit floor. Mining of the NEOC commenced in 2003 and after seven years is now in the final stage of coal extraction.

In March 2009, ACOL lodged an application (MP 08_0182) to develop a new open cut mine as a replacement for the NEOC, the SEOC Project. The intention was to transition existing open cut mine workers and equipment across to the SEOC, thereby enabling security of employment for the open cut workforce and continuity of coal supply.

Approval of the SEOC Project and completion of coal extraction in the existing open cut pit has not aligned as anticipated. Consequently, transition of open cut mine workers and equipment between the two open cuts will not occur as previously planned.

ACOL is now proposing to excavate a small (6 ha) area to a depth of about 15 m below the floor of the NEOC pit to access about 100,000 t of ROM coal in the Hebden Seam. This will not affect any other aspect of the operation of the open cut mine, with the exception that the life of open cut mining will be extended for an additional three months, albeit at a greatly reduced scale and rate.

The carrying out of this development will provide continued employment for up to 80 mine workers (45 equipment operators, 20 maintenance trade workers and 15 support staff) for about three months, while the SEOC Project is determined. It will also provide a small quantity of additional coal to assist ACOL maintain export coal supply in the short-term.

4.2.3 Condition 3.14 Amendment

Following approval of DA 309-11-2001-i MOD 6, ACOL provided a geotechnical report on the stability of first workings (face lines and back roads) for LW 6B and 7B for I&I's consideration, in accordance with the requirements of condition 3.14 to schedule 2 of DA 305-11-2001-i:

The Applicant may carry out first workings within the underground mining area, other than in accordance with an approved extraction plan, provided that DII [I&I] is satisfied that the first workings are designed to remain long-term stable and non-subsiding.

Note: The intent of this condition is not to require an additional approval for first workings, but to ensure that first workings are built to geotechnical and engineering standards sufficient to ensure long term stability, with zero resulting subsidence impacts.

In considering whether the information provided in the report satisfied the requirements of the DA, I&I determined that the development of first workings could not technically comply with the requirements of the condition as intended in its drafting. That is, first workings that become part of the longwall void following longwall extraction (i.e., such as gate roads and face lines) cannot technically meet the requirements of remaining long-term stable and non-subsiding, as they will form part of the subsided longwall void or be within its angle of draw. Hence, I&I could not authorise the development of the proposed and assessed first workings as they would not remain long-term stable and non-subsiding.

To address this unintended conflict in the interpretation and application of the condition, DoP and I&I have agreed on amended wording, as follows:

The Applicant may carry out first workings within the underground mining area, other than in accordance with an approved extraction plan, provided that DII is satisfied that the first workings are designed to remain long-term stable and non-subsiding, except insofar as they may be impacted by approved second workings.

Note: The intent of this condition is not to require an additional approval for first workings, but to ensure that first workings are built to geotechnical and engineering standards sufficient to ensure long term stability, with zero resulting subsidence impacts.

Modification of the development consent is required to facilitate amending condition.3.14.

4.3 Description of Proposed Modification

4.3.1 Underground Mine Interim Gas Drainage

As indicated, approximately fifteen gas drainage wells will be established at strategic locations across the area of the remaining unmined PG Seam, within the surface disturbance footprint of the underground mine layout (Figure 2). The wells will be established at 300 to 400 m intervals parallel to the centre line of each unmined longwall panel (LW 6B, 7A, 7B and 8), with final locations selected to minimise impacts on flora and fauna, Aboriginal heritage and surface drainages (see Section 5).

The gas wells will be similar in design to the three wells established under the exempt development provisions of the Mining SEPP (Figure 3, Figure 4 and Photograph 1). This will generally require:

- Establishing an approximate 20 x 15 m level pad to be surfaced with road base material at each well location.
- Drilling a 300 mm diameter borehole to just above the mining section of the PG Seam.
- Completing the drill hole with metal casing, vent stack, lightning arrestor, flame suppression apparatus and shut-off valve.
- Erecting a 1.8m high perimeter security fence around the pad and well head.
- Temporarily installing pump apparatus, associated piping and support infrastructure on the secured pad area at the active well head. (This equipment will be relocated to each successive well head in line with the advancing longwall face).

Construction of each pad, drill hole and well head will be carried out by a crew of up to ten workers. Construction will be carried out during daytime hours only, up to seven days a week, with each pad and well head estimated to take about one week to complete. Construction of the wells will generally be carried out on a campaign basis, per longwall panel.

Site access will be via the existing Dairy and Brunkers lanes (Figure 2). Existing farm access tracks will be used to access pad sites, wherever possible. However, up to about 1.5 km of additional tracks may be required to be established. Where additional access tracks are established these will be graded and/or gravel dressed to an approximate width of 4 m and designed so as to avoid impacting native flora and fauna, Aboriginal heritage and surface drainage lines, where possible.

A range of equipment will be required during construction of the wells, including a front end loader (to level the pad and prepare drill sumps); drill rig and support vehicle; water cart (for dust suppression); grader (to establish additional access tracks); and a small number of light vehicles and delivery trucks.

Each pad will be slightly raised using excavated material from drill sumps and covered with road base (i.e., gravel) to provide a generally level free draining surface. Sediment controls, such as clean water diversions, sediment fencing and hay bales will be established to divert clean water runoff away from disturbed areas and to prevent sediment laden water entering local drainage lines. The approximate disturbance area of each pad and well site during construction will be about 0.05 ha.

Each well will be drilled in advance of mining to a depth that targets the future goaf zone (about 17 m above the top of the PG Seam). Drill holes will be cased using a combination of 290 and 300 mm steel casing (Figure 3), and fitted with an approximate 3 m high steel vent stack complete with lightning arrestor, flame suppression apparatus and shut-off valve. Alluvial aquifer zones intercepted in drill holes will be sealed to prevent water draining into the mine.

At this stage a 1.8 m wire mesh (or equivalent) security fence and lockable gate will be installed around the perimeter of the pad (Photograph 1). Disturbed areas not required for ongoing access and operation of the gas wells (such as drill sumps and spoil piles) will be rehabilitated.

A well will become operational once the longwall has passed underneath it and goaf forms. At this point a small (1,000 cfm) diesel powered air compressor; 2,000 L self-bunded diesel storage tank; suction pump apparatus and associated piping; safety and low gas content shut down system; and solar powered monitoring and telemetry equipment will be fitted to the well head to enable pump assisted gas drainage of the underlying goaf. Suction pumping will continue at the active well head

until either the level of methane in the exhausted gas stream is below 30% or the next well has been undermined by the longwall. At this point the pumping apparatus and support infrastructure will be relocated to the next well.

This process will be repeated as the longwall advances passing beneath each successive well. With each move of pumping apparatus the active well will become inactive, but may be allowed to continue venting naturally (Photograph 2). When there is no more immediate requirement to continue venting or methane is not detected in the venting gas stream the well head will be sealed (valve and lock arrangement), until such time that venting of lower seams is required. It is anticipated that each well will remain active for about two months.

Suction pump assisted gas extraction will be undertaken initially using a venturi pump system capable of exhausting gas at a rate of up to 800 L/s (hence the need for the diesel powered air compressor). Currently this represents the safest and most effective temporary gas pumping apparatus. However, ACOL is currently investigating alternative methods of pumping and energy sources, including potential use of a small portable gas fired generator, with the gas sourced from the well itself. If such an alternative arrangement is deemed feasible, based on safety and environmental considerations, it will be used in place of the venturi system at later developed well locations. This would have the added advantage of dispensing with the need for an air compressor and diesel fuel tank at the well head.

As underground mining continues to subsequent seams it is expected that the buoyancy effect of methane will allow the gas to rise into the PG Seam goaf zone. This will enable the wells to be reactivated and may avoid the need to extend the wells to a lower depth. It is envisaged that the gas wells may be incorporated into a future site wide gas drainage system (see Section 4.2.1) and will continue to operate until completion of the underground mine. At this point the wells will be decommissioned, the infrastructure removed and the pad site rehabilitated to be consistent with the final land use objectives for the underground mine area.

4.3.2 Open Cut Hebden Seam Recovery

The proposed Hebden Seam extraction area is located in the southern corner of the existing open cut and will extend to a depth of about 15 m from the base of the pit floor. This will enable about 100,000 t of ROM coal to be mined from the Hebden Seam over a period of about three months. The proposed open cut Hebden Seam extraction area is within the Barrett Pit and is shown in Figure 5.

Excavation is planned to commence immediately following approval using existing open cut equipment and mine workers, and in exactly the same manner as currently approved for the NEOC (including open cut mine operating hours and method of mining), albeit at a reduced mining scale and rate. Due to the small size (about 6 ha) and depth extent (15 m) of the extraction area only about half of the open cut fleet and workforce (up to 80 employees) will be used.

Approximately 650,000 bcm of waste interburden material will be excavated to a depth of about 13 m to expose and enable recovery of the Hebden Seam. This will require use of one full time and one part time excavator; six haul trucks; one in-pit dozer and one overburden dozer; two drill rigs; one grader; and one water cart. (Other mine fleet will continue to be used in approved rejects disposal and rehabilitation activities). This will enable up to about 320,000 bcm of interburden and 35,000 t of ROM coal to be mined each month, noting that this will scale down over the three month mining period. This is compared to between 600,000 and 885,000 bcm of interburden and between 139,000 and 159,000 t of ROM coal mined each month for the last three years.

The Hebden Seam extraction area will be mined in three strips with each strip progressing from east to west away from the existing eastern highwall and spoil buttress, adjacent to Glennies Creek Road. The northern most strip will be mined first (Figure 6). Excavated interburden will initially be transferred via haul truck for emplacement within the existing NEOC mine void (Arties Pit), with the remainder being used to progressively backfill the excavated mine strip. This progressive mining and backfilling sequence has been specifically designed to ensure that structural integrity and stability of the eastern highwall is maintained throughout and post Hebden Seam recovery.

In 2006, a spoil buttress was established against the eastern highwall to mitigate a highwall instability event which impacted the adjacent Glennies Creek Road. In 2009, the base of the spoil buttress was increased by 30 m to enable the pit to be deepened by a further 35 m. Strip mining and progressive backfilling was used on this occasion to deepen the pit against the eastern highwall without incident.

Mining in the same manner will ensure the stability and structural integrity of the eastern highwall is not compromised by excavating down to the Hebden Seam, with progressive backfilling of the extraction area providing added support to the existing buttress and eastern highwall (see Section 5.2.3).

The Hebden Seam ROM coal will be transferred via haul truck to the CHPP for stockpiling and processing and eventual transport via rail for export from the Port of Newcastle, as per existing approved arrangements. Processing of this additional ROM coal will yield an estimated 25,000 to 35,000 t of rejects and tailings. These waste materials will be disposed of in the Ravensworth and NEOC mine voids, as per existing approved arrangements.

The final landform and land use for the NEOC will not change as a result of the proposed modification

5 IMPACTS, MITIGATION AND MANAGEMENT

5.1 Underground Mine Interim Gas Drainage

5.1.1 Noise

Spectrum modelled the potential noise impacts of the operation of the gas drainage wells on surrounding private residences using measured noise levels for the existing wells. Spectrum concluded there will be no increase in mine noise levels and no potential for noise disturbance at any private residence due to the operation of the wells under worst case meteorological conditions. Spectrum's report is included as Appendix 1.

Construction noise will be short-term, constrained to daytime hours, occur at distances of 2 km or greater to the nearest private residence and will not be distinct from other activities normally carried out at the mine. Consequently noise from construction activities is not expected to impact any private residence and no additional noise mitigation or management measures are required to be implemented for the development.

5.1.2 Air Quality

PAEHolmes assessed the dust and greenhouse gas (GHG) emissions from the construction and operation of the gas wells. PAEHolmes' report is included as Appendix 2.

Well construction will occur in an area at least 2 km from the nearest private residence, will be generally short-lived and comprise only small scale dust and particulate generating activities. Consequently, air quality standards will not be compromised at any private residence due to the construction of the wells. Notwithstanding, PAEHolmes has recommended measures, which ACOL will implement, to minimise and manage dust emissions, including:

- Minimising disturbance areas.
- Restricting vehicle speeds on dirt tracks.
- Regular and frequent watering of access tracks and exposed construction areas, particularly during hot and windy conditions and when stripping soil.

Similar to construction activity air quality emissions, fuel emissions from the active well head air compressor will be minor (compared to other vehicle and machinery emissions across the mine site) and rapidly dispersed, and hence will not compromise air quality goals at any private residence.

Carbon Dioxide (CO₂) and methane (CH₄) gas emissions are released during mining of the coal. These are both significant GHGs. They also pose a significant safety hazard to underground mine operations. The purpose of the wells is to improve the efficiency of mine ventilation and mine atmosphere by providing an avenue for enhanced gas exhaustion close to the operating area of the mine.

PAEHolmes estimate annual Scope 1 GHG emissions to be exhausted from the wells will be about 328,178 t CO₂-equivalent. A further 1,128 t CO₂-equivalent annually is estimated to be generated from use of the diesel powered air compressor. Combined, these GHG sources represent an increase of about 0.06% to total 1990 baseline Australian GHG emissions. If the wells are not developed this same level of GHG emissions will occur via other existing mine ventilation pathways. Hence the wells will not lead to an increase in GHG emissions at the mine, simply an alternate emission location.

As previously indicated ACOL is investigating alternatives for a more substantive gas drainage system to be developed across the whole of the underground mine to provide a long-term solution to mine gas drainage. This will include options for gas flaring and or re-use and is currently proposed to

be implemented prior to longwall mining commencing in the ULD Seam. In the interim and as an immediate underground mine gas management strategy, the proposed gas drainage wells will vent directly to atmosphere.

Currently, ACOL is required to report its GHG emissions under the National pollutant inventory. It also has an agreement with the Australian Greenhouse Office, under the Greenhouse Challenge Plus Program Framework through its parent company Yancoal.

5.1.3 Aboriginal Heritage

Insite assessed the potential impact of constructing the gas drainage wells on Aboriginal heritage. Insite's report is included in Appendix 3.

The location of Aboriginal sites above the underground mine is well known due to numerous past surveys required for mine subsidence impact assessments and the Bowmans Creek diversion development consent modification application (Wells, 2009b). In addition, ACOL has implemented on-site procedures that must be followed prior to carrying out any ground disturbance activities. These have been developed in consultation with Insite and the local Aboriginal community and include involving Aboriginal stakeholders in site inspections prior to ground disturbance.

Well pad sites have been specifically selected to avoid known locations of Aboriginal artefacts. However, there is some potential for new subsurface items to be uncovered during surface disturbance activities, particularly once the paddock grasses have been cleared and topsoiled stripped. As a result Insite has recommended measures, which ACOL will implement, to manage impacts to Aboriginal sites during construction of the wells, including:

- Salvaging or relocating isolated Aboriginal artefact finds of low significance to outside the area of works rather than relocating the pad site, which may only uncover more of the same material. This will require an Aboriginal Heritage Impact Permit to be obtained from the DECCW to allow the artefacts to be moved.
- Relocating pad sites where a potentially complex artefact scatter or potential archaeological deposit (PAD) is uncovered during construction of the pad, and full recording and reporting of the PAD on the ACOL and AHIMS databases.

Where additional or alternate access tracks are required these will be routed and designed to avoid impacting known Aboriginal sites and the same recommended management procedures for pad sites will be applied.

Further, Aboriginal heritage management and ACOL's detailed site disturbance procedures will be a mandatory component of site inductions for construction crews.

5.1.4 Terrestrial Ecology

PAE assessed the impact of constructing the gas drainage wells on terrestrial ecology. This includes a review of prior surveys to evaluate the ecological value of the development area. The full report is included in Appendix 4.

PAE's assessment identified the existence of a range of habitats across the underground mine area, including riparian corridors, floodplain pasture, flood terraces, upland forest, woodland remnants, farm dams and pasture with scattered trees. A small number of isolated mature hollow-bearing trees scatter the development area providing only marginal habitat value for bird, bat and arboreal mammal species.

Construction of the well pads and access tracks will have a direct impact on about 1.7 ha (about 1.5 km of new access tracks and approximately 15 well pad sites) of grassed paddocks, previously cleared for livestock grazing, and will not require clearing of any treed vegetation. Consequently, the loss of, or impact to, existing native fauna habitat will be minor. Further, there will no direct impact on any threatened species from carrying out the development.

Notwithstanding, PAE has recommended measures, which ACOL will implement, to ensure potential flora and fauna impacts are minimised, including:

- Restricting site access to existing tracks and proposed disturbance areas, wherever possible.
- Where additional or alternate access tracks are required these will be routed and designed to avoid impacting native flora and fauna (and Aboriginal sites).
- 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.
- Including on-site driving behaviour and off limit areas in site inductions.

5.1.5 Soils, Sediment and Erosion

Some disturbance of soils will be required to enable construction of well pads and additional access tracks, where required. Topsoil will be stockpiled for use in rehabilitating disturbed areas which are no longer required for ongoing operation or access. Stockpiles will be small in size and located adjacent to pad sites and additional access tracks, where required.

Erosion and soil loss during construction will be mitigated through use of standard 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 road base.
- Stabilising stockpiles that will be left for any length of time with jute mesh or grass cover.
- Immediately remediating erosion damage.
- Promptly rehabilitating disturbed areas no longer required for ongoing operation of the wells.

5.1.6 Surface water

Well pad sites have been sited at least 40 m away from Bowmans Creek and other major surface drainage lines so as to avoid direct impacts on surface water sources. In addition, the pads will be slightly raised and surfaced with road base to provide a free draining surface. Clean water runoff will be diverted around the pads and runoff from the pads will be directed to a sump or other sediment control structure.

A self-bunded diesel storage tank will be used to reduce the risk of fuel spillage and a spill containment kit installed at the active well head.

5.1.7 Traffic

All access to the area off the New England Highway will be via Brunkers and Dairy lanes. Construction of the wells will add about vehicle 15 trips per day to the existing New England Highway traffic volume in the short-term. Currently the New England Highway carries about 11,000 vehicles per day. An increase of 15 daily vehicle trips as a result of the development will have negligible effect on existing highway traffic conditions.

5.2 Open Cut Hebden Seam Recovery

5.2.1 Noise

Spectrum assessed the potential noise impacts associated with mining to a depth of 15 m beneath the existing pit floor and interburden hauling and dumping within the current open cut void. Spectrum's report is included as Appendix 5.

Due to the greatly reduced scale of mining, interburden hauling and dumping and the depth at which these activities will be carried out there will be no increase to noise emission levels from approved open cut operations. Consequently, there will be no increase in ACP related noise levels at private residences in the village of Camberwell (adjacent to the mine) as a result of the proposed development.

5.2.2 Air Quality

PAEHolmes assessed the potential air quality impacts associated with mining the Hebden Seam. PAEHolmes' report is included as Appendix 6.

Mining of the Hebden Seam will involve excavating up to about 320,000 bcm of interburden and 35,000 t of ROM coal a month, noting that this will scale down over the three month mining period. This is compared to between 600,000 and 885,000 bcm of interburden and between 139,000 and 159,000 t of ROM coal mined each month for the last three years. At these higher monthly extraction rates the project specific 24-hour average and annual average PM₁₀ levels have remained below the relevant impact assessment criteria in the nearby village of Camberwell.

Consequently, the reduced mining rate for the Hebden Seam (i.e., a third less than previously mined in the NEOC) is not predicted to exceed annual average or short-term (24-hour) PM₁₀ air quality criteria at any private residence.

Notwithstanding, PAEHolmes has recommended existing dust control measures be continued for the period of mining the Hebden Seam.

5.2.3 Eastern Highwall Geotechnical Stability

Geotech assessed the impact of deepening the pit a further 15 m on the stability of the adjacent eastern highwall. Geotech's report is included as Appendix 7.

In July 2006, a portion of the NEOC eastern highwall incurred a level of instability which impacted the adjacent Glennies Creek Road. This resulted in the relocation of Glennies Creek Road and implementation of additional management controls to enable continued operation of the mine while maintaining safety to the realigned road. This included leaving approximately 270,000 t of ROM coal in situ (and subsequently sterilised) to maximise the stability of the eastern highwall. A series of spoil buttresses were progressively added to provide additional stability as excavation of the mine was continued a further 25 m in depth (from the Liddell Seam to the Upper Barrett Seam). The implementation of this stability control measure stabilised the eastern highwall and slowed its movement to allow safe continued mining without compromising the safe use of Glennies Creek Road.

In October 2009, minor cracking of the realigned road was detected. The area was inspected by geotechnical specialists (RCA Australia Pty Ltd) who recommended temporarily ceasing mining in that area. This was followed by a review of the mining method and design of supporting buttresses with the objective of deepening the mine by a further 35 m (from the Upper Barrett Seam to the Lower Barrett Seam). This review was carried out by RCA Australia Pty Ltd and peer reviewed by GHD Pty Ltd (GHD), both well respected geotechnical engineering firms. The resultant design incorporated an additional 30 m wide solid buttress on the Upper Barrett floor below the eastern highwall to increase the factor of safety for mining the lower seams.

The mining method was also modified to mine in a series of strips perpendicular to the wall. As each strip was mined, it was backfilled with overburden from the next strip to form an additional buttress from the Lower Barrett floor to reinforce the original buttress. Survey monitoring and regular geotechnical inspections were carried out during this process. The mining was successfully completed in early February 2011 without incident and has allowed ongoing safe use of Glennies Creek Road.

It is now planned to replicate this successful mining sequence for the removal of the Hebden Seam, which is 13 m below the Lower Barrett floor. The Hebden Seam recovery proposal has been assessed by Geotech and a similar progressive mining and backfilling buttressing support approach to that previously adopted has been recommended. (Note the RCA engineer who provided the prior successful design now works for Geotech).

Consequently, mining will occur in a series of 100 m wide strips followed by infill buttressing to enable a staged recovery of the Hebden Seam. This sequence will provide additional reinforcing to existing buttresses. Survey monitoring and visual inspections will continue throughout the period of extraction. Geotech's assessment and recommendations have been peer reviewed by GHD (Appendix 7).

The assessments indicate the adoption of mining methods and buttress designs, consistent with those successfully implemented during the previous deepening of the mine by 35 m, will provide ongoing stability of the eastern highwall and safety to the adjacent Glennies Creek Road.

5.2.4 Groundwater

RPSAquaterra modelled the groundwater impacts of mining a further 15 m beneath the existing pit floor. RPSAquaterra's report is included as Appendix 8.

Open cut and underground mining at the ACP has reduced groundwater levels within the Permian coal measures to the level of the Lower Barrett Seam (i.e., the base of the pit).

Modelling indicates mining down to the Hebden Seam will cause a limited and temporary increase in groundwater drawdown that will result in an additional groundwater inflow to the open cut mine of between 0.03 and 0.04 ML/day after the three months of mining is complete. This will have minimal effect on surrounding groundwater gradients and will not impact the quality or level of groundwater in areas or private bores surrounding the mine.

This additional minor groundwater inflow will be collected in the base of the pit and integrated into the existing ACP water management system.

ACOL currently holds a groundwater licence for dewatering the NEOC with an entitlement of 100 ML/year. This is more than adequate to account for the predicted increased level of inflow.

6 ENVIRONMENTAL MANAGEMENT COMMITMENTS

In addition to its existing approved environmental management plans and procedures ACOL will implement the following additional management measures to avoid or minimise the potential impacts associated with the proposed modification.

Table 3: Environmental management commitments

Item	Action
1	Aboriginal heritage
1a	Locations of well pads and access tracks have been designed to avoid known Aboriginal heritage sites, wherever practicable.
1b	Notwithstanding, well pad and access track locations will be surveyed for Aboriginal artefacts prior to disturbance and: <ul style="list-style-type: none"> Where additional significant Aboriginal artefact sites are identified the well pad or access track will be relocated to avoid impacting the Aboriginal site. Where additional isolated Aboriginal artefacts are identified these will either be salvaged or relocated under an appropriate AHIP.
1c	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	Dust
2a	Site disturbance will be minimised as far as practicable.
2b	A water cart will be used to suppress dust on access tracks and on well pad disturbance areas, where required.
2c	Disturbed areas not required for ongoing operations will be promptly rehabilitated.
3	Flora and fauna
3a	Locations of well pads and access tracks have been designed to avoid clearing native vegetation.
3b	Ground disturbance will be minimised as far as practicable.
3c	Site inductions will include identification of native vegetation exclusion areas and designated site access routes.
4	Soils and Erosion Control
4a	Industry standard sediment control measures will be implemented prior to ground disturbance, including use of clean water diversions, where required.
4b	Long-term stockpiles will be stabilised with jute mesh or grass cover.
4c	Clean water diversions will be implemented around well pads.
5	Surface Water
5a	The locations of well pads have been designed to avoid impacts to surface drainage lines.
6	Traffic
6a	Vehicle access will be restricted to designated site access routes.
7	Waste
7a	Construction waste will be recycled or disposed of in accordance with the existing ACOL approved Waste Management Plan.

7 CONCLUSION

The proposed modification will enable ACOL to:

- Reduce underground mine gas levels to enable continued safe operation of the mine.
- Maintain employment of open cut mine employees for a further three months until a decision on the SEOC Project is made.
- Carry out first workings according to the approved mine plan without the need for additional regulatory approvals.

The modification will not alter the size of the approved ACP mines, the operating hours, the mining methods, the rate of approved coal extraction and production, or the method and frequency of off-site coal transport. Further, the proposed changes will not radically alter or transform the approved project and the ACP will be substantially the same development as approved by the Minister.

Adoption of the management and mitigation measures recommended by specialist consultants and the carrying out of construction and operations in accordance with ACOL's existing approved management plans and site processes will mitigate any adverse environmental effect of the modification.

8 REFERENCES

HLA (2001). *“White Mining Limited Ashton Coal Project Environmental Impact Statement”*, prepared by HLA-Envirosciences Pty Limited.

Wells (2009a), *“South East Open Cut Project and Modification to the Existing ACP Consent”*, prepared by Wells Environmental Services Pty Limited.

Wells (2010b), *“Bowmans Creek Diversion Environmental Assessment”*, prepared by Wells Environmental Services Pty Limited.

Figures

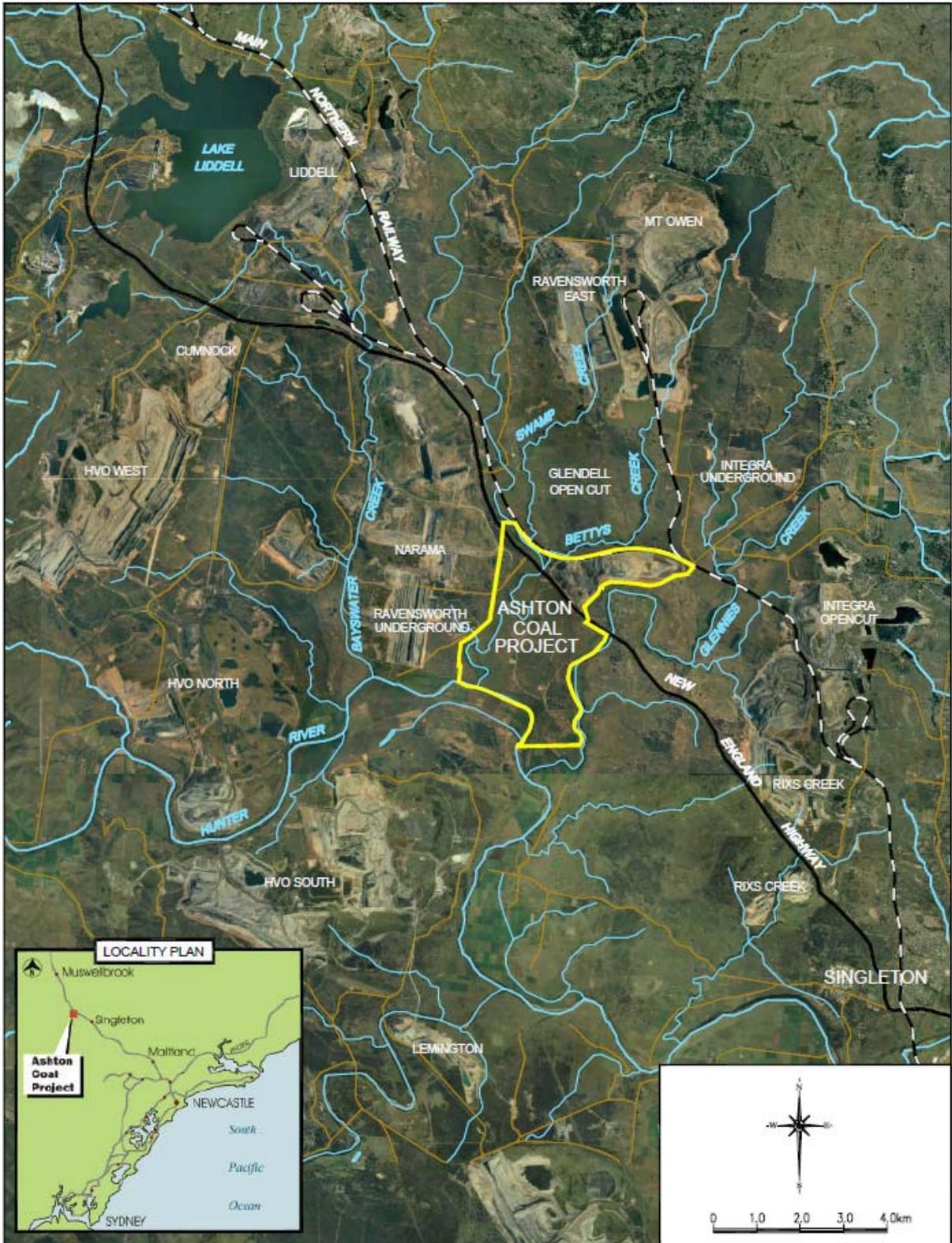


Figure 1: Ashton Coal Project location and setting

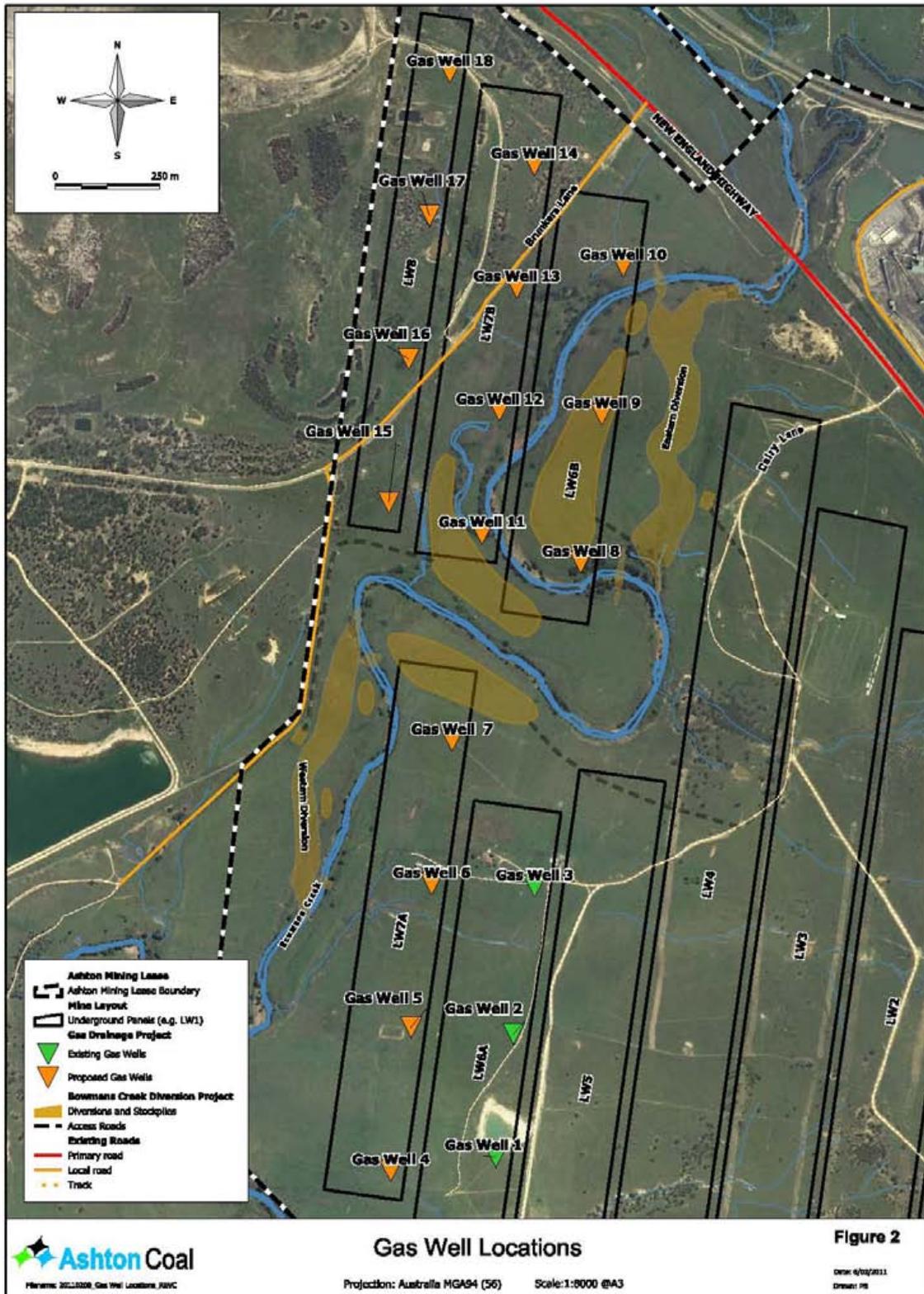


Figure 2: Indicative proposed gas well locations.

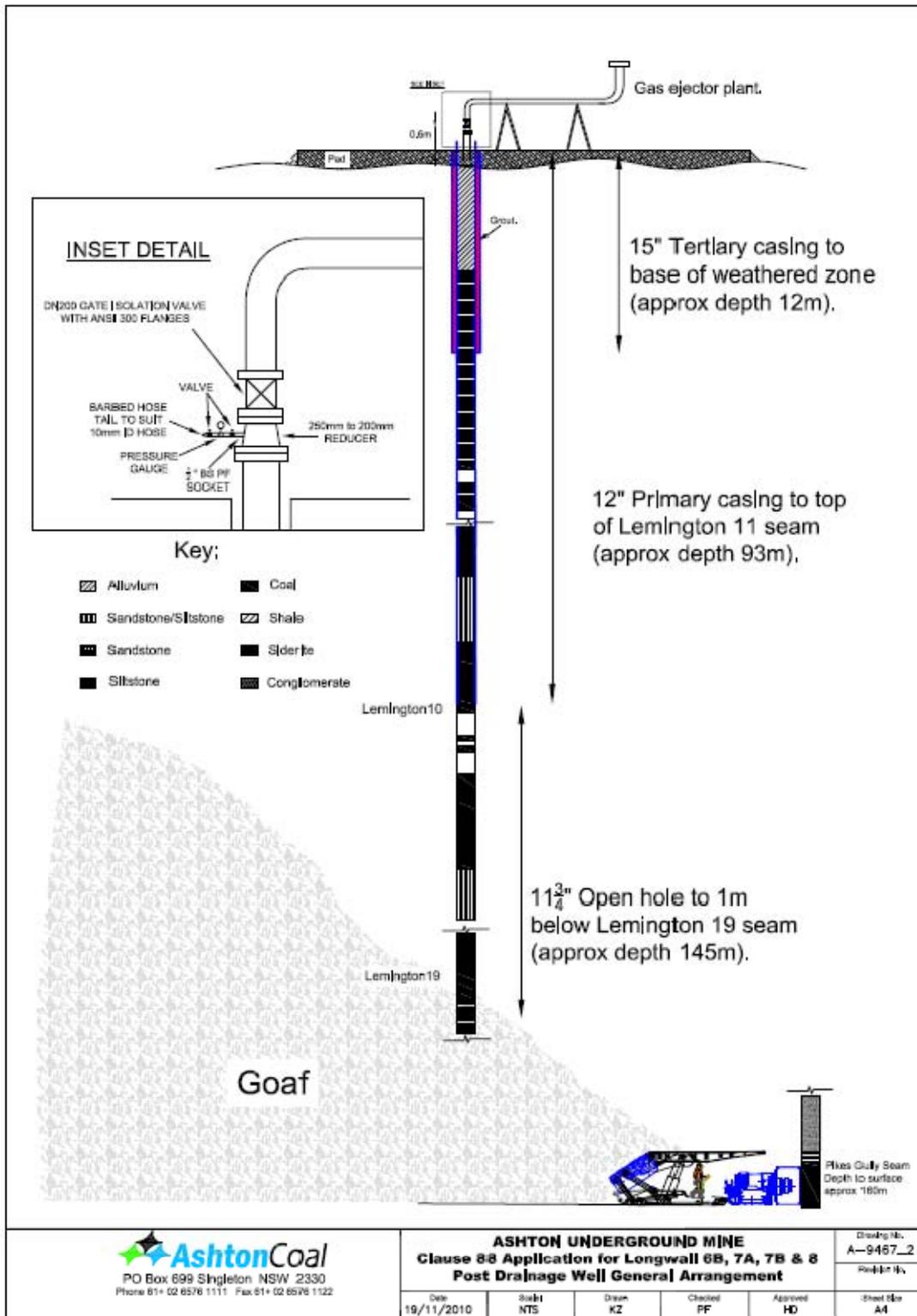


Figure 3 Schematic of a typical well.

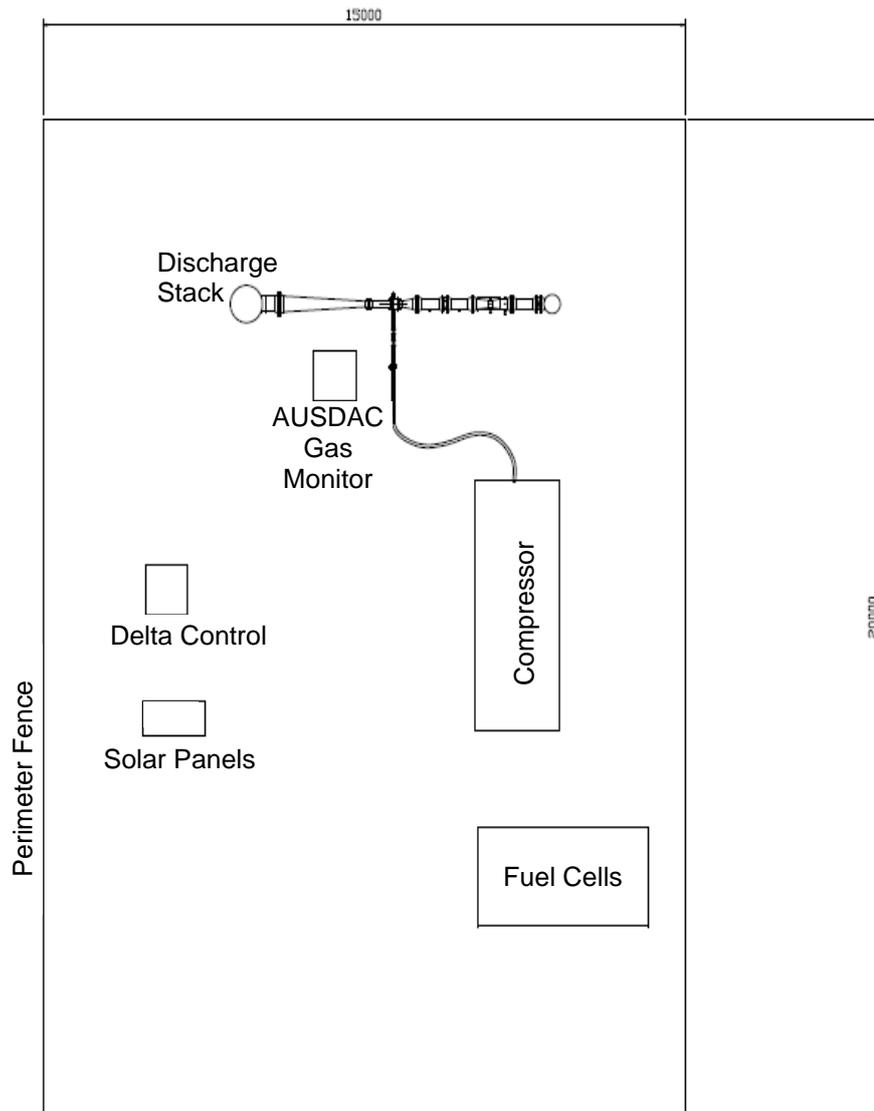


Figure 4: Indicative proposed active gas well pad compound layout.

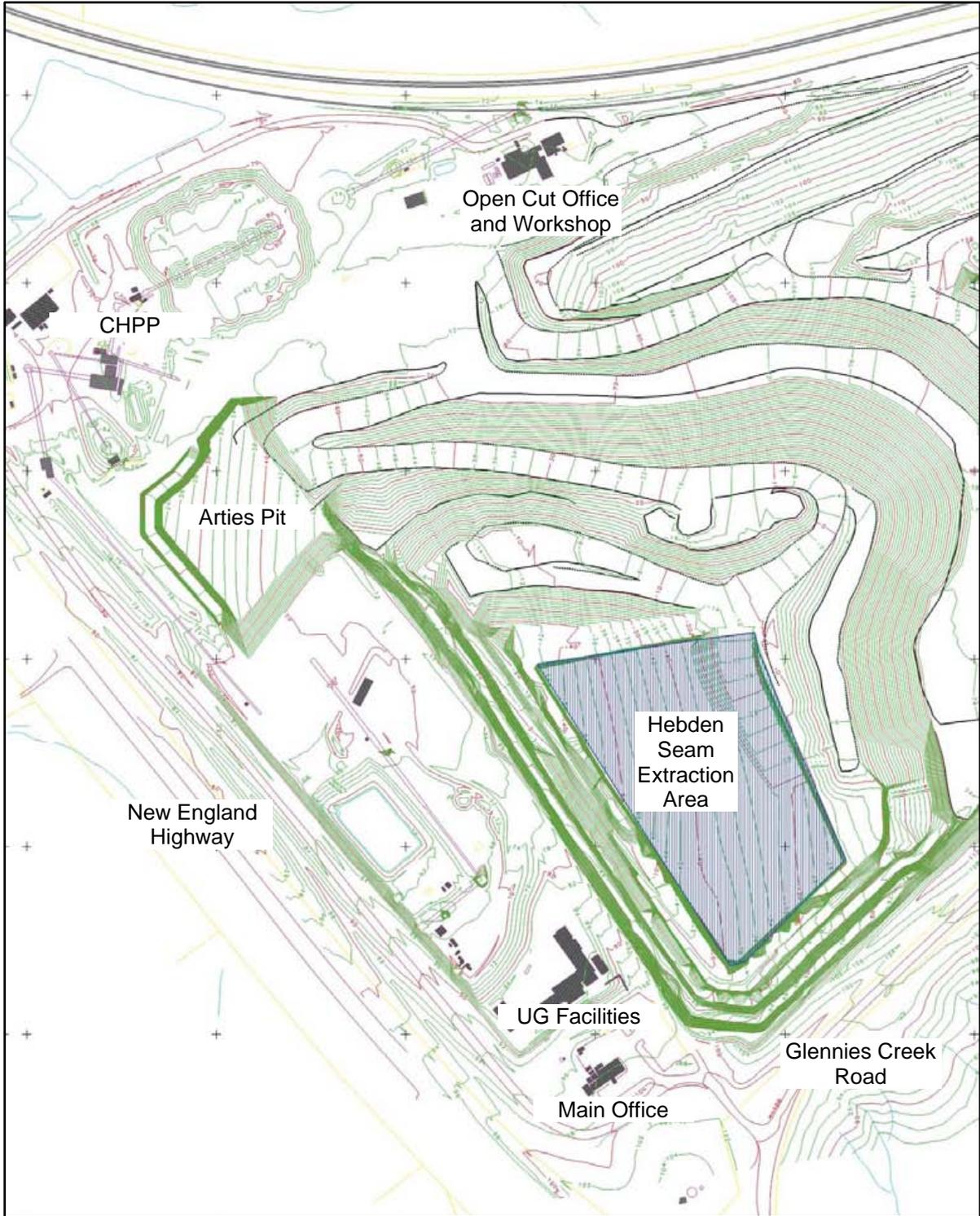


Figure 5: Hebden Seam extraction area.

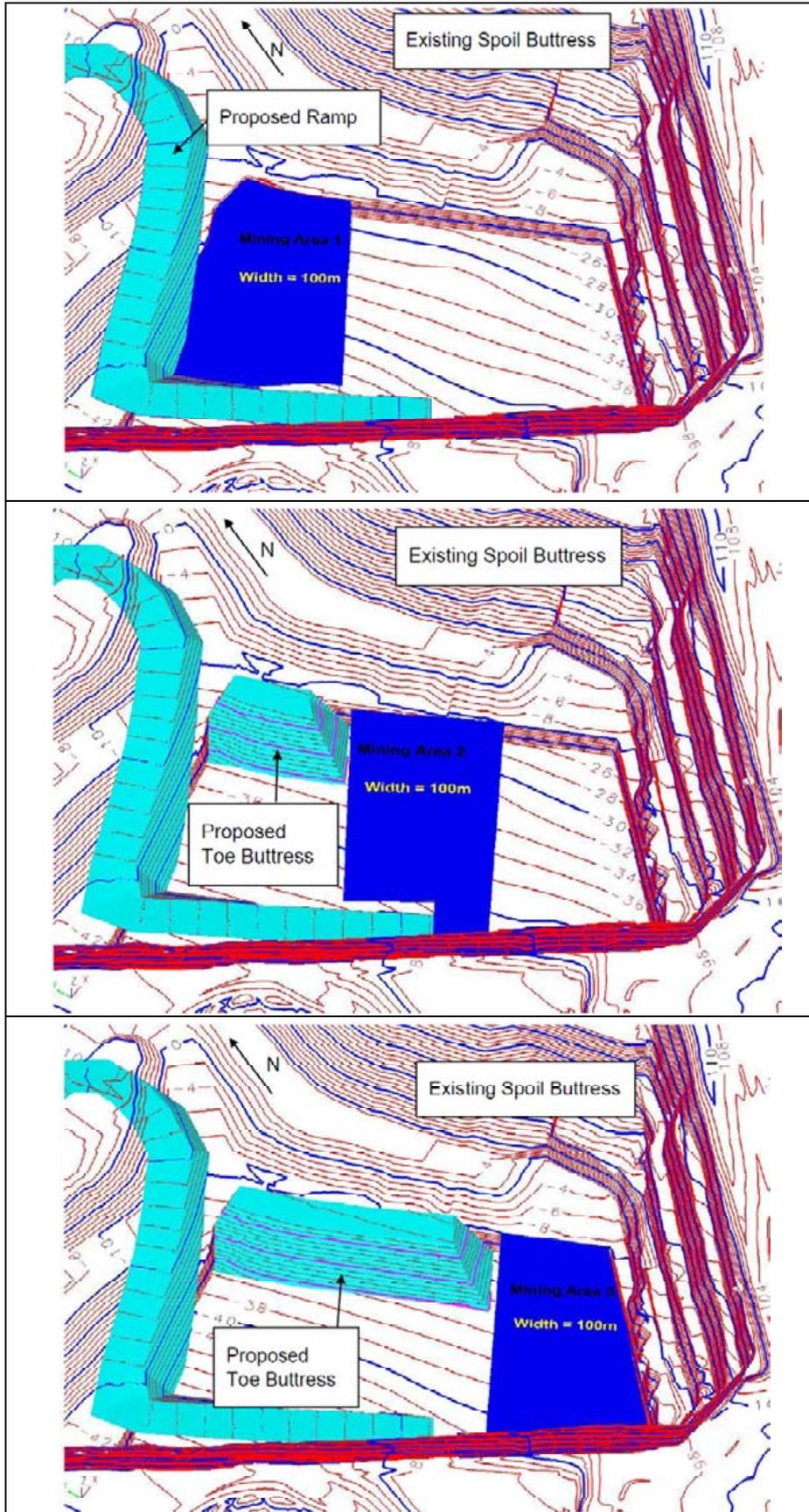


Figure 6: Hebden Seam mining sequence.

Photographs



Photograph 1: Suction pump assisted active venting gas well.



Photograph 2: Naturally venting inactive gas well.

