



ASSESSMENT REPORT

Hunter Valley Operations - Carrington Pit Extension

1. BACKGROUND

Coal & Allied Operations Pty Limited (the Applicant) owns and operates the Hunter Valley Operations (HVO) open cut mining complex about 18 kilometres northwest of Singleton in the Upper Hunter Valley (see Figure 1).



Figure 1.1 HVO North of the Hunter River



Figure 1: Hunter Valley Operations and Carrington Pit

The HVO mining complex produces around 18 million tonnes of coal a year, and consists of four operational mining areas separated by the Hunter River into HVO North and HVO South. Approximately 1,020 people are employed at HVO.

Mining operations at the Carrington Pit were originally approved by the Minister in August 2000. In May 2004, the Minister integrated the Carrington Pit consent into the West Pit Extension and Minor Modifications consent (the “West Pit consent”, DA 450-10-2003) along with 17 other separate approvals across HVO North. This consent allows extraction of up to 10 million tonnes per year from the Carrington Pit with mining to be completed by 2008.

The Applicant is now proposing an extension to the Carrington Pit that involves extending mining to the south and east to extract up to an additional 19 million tonnes of coal resources (see Figure 2).

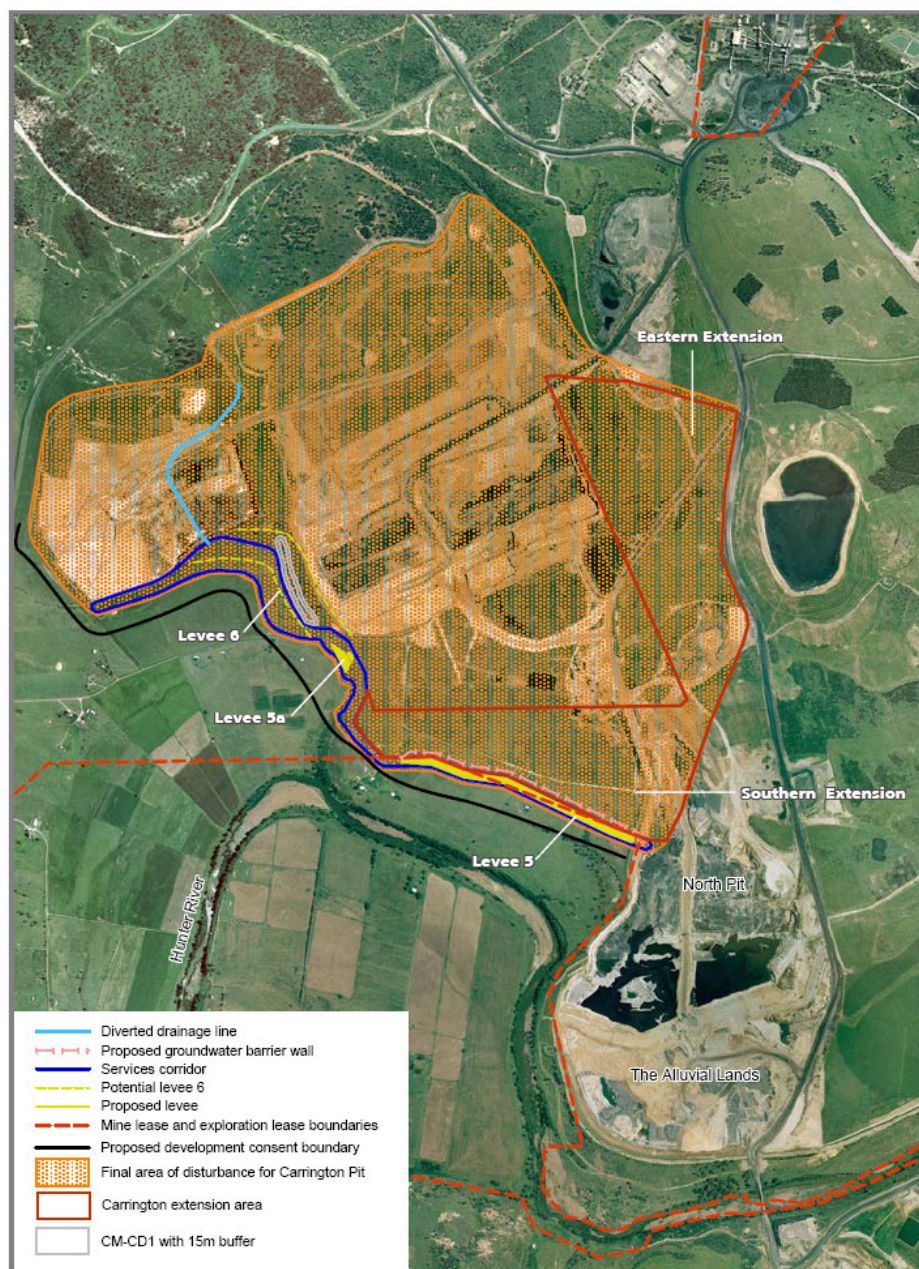


Figure 2.1 Proposed Carrington Extension and Features

Figure 2: Proposed Carrington Pit Extensions and Other Features

2. PROPOSED MODIFICATION

On 7 October 2005, the Applicant lodged a modification application (MOD 166-10-2005) under section 96(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and an accompanying Statement of Environmental Effects (SEE). The proposed modification involves (see Figure 2):

- extending the existing Carrington Pit further to the south and east to extract approximately 19 million tonnes of coal;
- constructing 2 levee banks, a groundwater barrier wall, a drainage line diversion to the west, and a temporary services corridor to the south of the extension area; and
- rehabilitating the site.

The proposal affects approximately 140 hectares (ha) of land wholly owned by the Applicant. The mining footprint would be extended approximately 60 ha to the south and 80 ha to the east. The 60 ha to the south is mainly Class IV agricultural land presently used for agricultural purposes and is currently undisturbed by mining. The remaining area of 80 ha to the east is a recently rehabilitated overburden dump, which would be re-mined to a greater depth.

The extension would be mined using generally the same personnel and mining equipment as are currently approved. The overall rate of production at HVO North would remain within the currently approved limit, but the life of the Carrington Pit would be extended by between 4 - 7 years (until some time between 2011-2014).

3. STATUTORY CONTEXT

Permissibility

The proposed development is located on land zoned 1(a) Rural under the *Singleton Local Environmental Plan 1996*, and is permissible with consent in this zone.

Consent Authority

The Minister was the consent authority for the original development application (DA 450-10-2003), and is consequently the consent authority for this application.

On 5 April 2006, the Minister delegated his powers and functions as a consent authority to the Executive Director, Sustainable Development Assessments for certain modifications to consents under Part 4 of the EP&A Act. The current application meets the relevant delegation criteria, and consequently, the Executive Director may determine the application under delegated authority.

Section 96

Under section 96(2) of the EP&A Act, a consent authority may modify a development consent if it is satisfied that the “development to which the consent as modified relates is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified (if at all)”.

The Department is satisfied that the development to which the consent as modified relates would be substantially the same as the development for which consent was originally granted as the proposed extension of the Carrington Pit represents a small increase in the mining area compared to that approved by the Minister in 2004.

Environmental Planning Instruments

The following planning instruments are relevant to the proposal:

- *State Environmental Planning Policy No. 11 – Traffic Generating Developments;*
- *State Environmental Planning Policy No. 44 – Koala Habitat Protection;*
- *Hunter Regional Environmental Plan 1989; and*
- *Singleton Local Environmental Plan 1996.*

The Department has assessed the proposal against the relevant provisions in these instruments (see Appendix 1), and is satisfied that the proposal is consistent with their aims, objectives and requirements.

4. CONSULTATION

The Department exhibited the DA and SEE between 8 November 2005 and 25 November 2005, in accordance with the requirements for public participation in the *Environmental Planning and Assessment Regulation 2000*. During and after the exhibition period, a total of 5 submissions were received from government agencies and one from a local private landowner. The submissions were as follows:

The **Department of Environment and Conservation** (DEC) noted that the SEE refers to the “potential” installation of a groundwater barrier wall between the southern extension and the Hunter River “if it is confirmed that the barrier is required” to isolate the Hunter River from the influence of mine-related dewatering. The DEC recommended that conditions instead be included in the modification to require the construction of appropriate groundwater barriers within 2 years of mining commencing.

The **Department of Natural Resources** (DNR) noted the need for the Applicant (following modification of the consent) to submit an application to modify the existing groundwater licence under Part 5 of the *Water Act 1912* for Carrington to cover the additional groundwater seepage from the extension. It sought:

- a buffer of 200 metres between the mine pit and the northern extent of a billabong of the Hunter River (located south of the southeastern corner of the proposed extension);
- further consultation with the Applicant concerning buffer requirements between the Hunter River and the western corner of the proposed extension;
- an audit of existing water management infrastructure and licensing arrangements for HVO North (as required by the consent); and
- consequential modifications to the HVO North Water Management Plan.

The **Hunter Regional Development Committee** (HRDC, associated with the Roads and Traffic Authority) raised no objections to the proposal, but recommended that the Applicant should submit a safety audit of public roads used by employees and services to the development to the RTA and the Singleton Shire Council and that any consequential improvements to public roads should be at the Applicant’s cost.

The **Department of Primary Industries** (DPI) and the **Mine Subsidence Board** (MSB) raised no objections to the proposal.

The local private landholder objected to the proposed extension, and raised concerns about the potential dust, noise, visual and cumulative impacts of the proposal, as well as concerns about the loss of residential amenity and property values.

The Department has assessed all of the issues raised in the submissions in Section 5 of this report.

5. CONSIDERATION OF KEY ISSUES

5.1 *Groundwater*

The geomorphic and groundwater environment adjacent to the Carrington Pit and proposed extension is somewhat unusual. The Carrington Pit is located on an ancient river bed of the Hunter River (a palaeochannel) which extends in a large loop to the north of the existing river channel (see Figure 3). This palaeochannel is filled with river gravels and silts. The proposed southern extension would bring the southern edge of the Carrington Pit some 500 metres closer to the Hunter River in the eastern arm of this palaeochannel.

Groundwater impacts associated with the proposed extension were assessed by Mackie Environmental Research (MER, see Annex D to the SEE). There are two aquifer systems in the area of the Carrington Pit. There is an alluvial aquifer within the palaeochannel and one within the underlying coal measures. Both are saline and have had little or no rainfall recharge in recent years. The saline nature of the alluvial aquifer results from upwards leakage of groundwater from the coal measures, perhaps coupled with decreased overbank flood flows from the Hunter River over recent years.

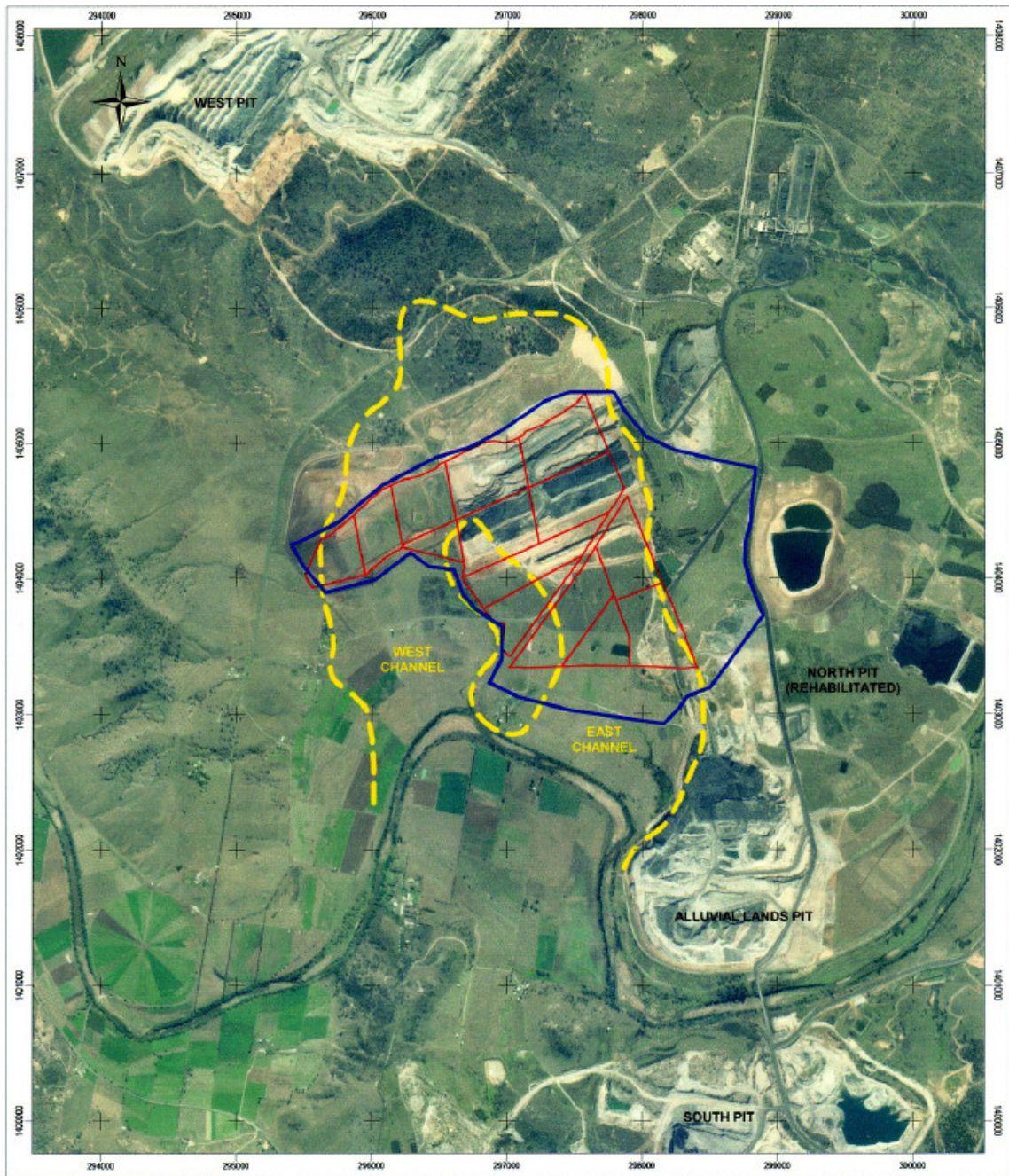
Water levels within the alluvial aquifer have steadily declined in both the west and east channels as a result of mine dewatering and the prevailing drought conditions over the last three or four years. MER reports that alluvial groundwater levels are expected to continue to decline due to mine dewatering, and seepage from the alluvium to the pit associated with currently approved mining is predicted to fall from an initial rate of around 2.0 Megalitres/day (ML/day) and stabilize at about 0.2 ML/day (assuming drought conditions).

MER's regional computer model simulations incorporating proposed mine development at both West Pit and North Pit indicate that the coal measure aquifers at Carrington would depressurise to a depth of about 70 metres over the period of active mining. Depressurisation regimes for both the approved and extended mining scenarios do not differ significantly. Pit seepage rates from the coal measures would rise to about 0.45 ML/day at the completion of mining. Thus a total pit seepage rate of 0.65 ML/day is predicted for the currently approved mining extent (alluvium plus coal measures). This would rise to 0.75 ML/day with the proposed extension taken into account.

Groundwater Barrier Walls

The existing hydraulic gradient in the alluvium is southward, with saline seepage migrating towards the Hunter River. However, mine dewatering would lead to a slow reversal of this gradient. With currently approved mining, reversal is predicted in early 2007, after which time leakage from the river to the alluvium would commence. This leakage is then predicted to increase from 0.02 ML/day to a sustained rate of 0.08 ML/day by 2010.

The proposed southern extension involves mining an extra 500 metres through the alluvium closer to the river. This would increase the rate of leakage from the alluvium to the pit from a stabilised 0.2 ML/day to 0.3 ML/day. More importantly, it would increase the rate of flow from the Hunter River once the hydraulic gradient reverses in early 2007. This leakage is then predicted to increase from 0.02 ML/day to a sustained rate of 0.13 ML/day by 2010.



0 500 1000 1500 2000 2500 Metres
 ISG co-ordinate system. Scale 1:20000

- outline of proposed new extents (2005)
- mine blocks for approved extents (1999 EIS)
- - - perimeter of alluvial palaeo channel

Figure 3: Hunter River palaeochannel and approved and proposed Carrington Pit mining operations (after Mackie, 2005).

Even though the predicted flows are not large, the Department, DEC and DNR are all concerned at the loss of water from the river through the alluvium and into the Carrington Pit. Of equal concern to agencies is that, after mine closure and the re-saturation of spoils within the pit, highly saline groundwater may migrate into the alluvium and thence to the river.

The SEE reports that leakage from the river can be greatly mitigated by installation of “cut off” walls (i.e. groundwater barrier walls) across the palaeochannel. Such walls would also substantially inhibit long term leakage of saline leachate from spoils

southward into the undisturbed alluvium. A similar barrier wall has been successfully used by the Applicant at its Alluvial Lands Pit which is southeast of the proposed southern extension. Even so, the SEE did not advance a barrier wall as a firm component of the proposed modification, but rather as a potential element subject to further modelling and the views of agencies. The Applicant has since accepted the view of agencies that a barrier wall across the eastern arm of the palaeochannel is required.

The SEE also contains some discussion about various options for construction of a barrier wall (see sections 2.2.4 and 5.3.3, figures 5.1 and 5.2, and section 3.1.3 of Annex D). The Applicant's currently preferred option for the southern extension is to construct the wall as mining retreats. This option would involve the installation of impermeable material against the high wall when mining is completed (i.e. prior to the emplacement of spoil). The alternative is excavation of a deep slot within the alluvium prior to mining reaching its full extent and the installation of impermeable material within this slot. This second option would be more expensive, and given the relatively low rates of groundwater flux, may not prove necessary.

MER's simulations indicate a relatively flat water table south of the barrier while, north of the barrier, the pit is dewatered. A steep hydraulic gradient would therefore prevail across the barrier wall. Groundwater levels to the south would rise slightly in response to isolation from mine dewatering and to rainfall recharge over time. A weak southward hydraulic gradient would then be re-established southwards to the river.

MER's simulations are based on the installation of barrier walls across both the east and west arms of the palaeochannel. The SEE does not generally advance or discuss the proposal for the western barrier wall and it is true that the proposed southern extension would encroach much closer to the Hunter along the eastern arm of the palaeochannel (between 440 and 650 metres) than is currently proposed along the western arm (around 1150 metres). Consequently, the Department is generally satisfied that a second barrier wall on the western arm of the palaeochannel is not necessary for the proposed extension, but notes that if at some future time the Applicant seeks to mine closer to the river in this area a barrier of some kind is likely to be required.

In summary, the Department believes the Applicant should be required to construct a groundwater barrier wall across the eastern arm of the palaeochannel within 2 years of approval of the modification (or as otherwise agreed with the Director-General). The Department is generally satisfied that this would effectively prevent leakage from the Hunter River alluvium into the Carrington Pit.

However, the preferred location and design of the groundwater barrier is yet to be finalised. Consequently, the Department believes that the Applicant should be required to investigate all reasonable and feasible design options for the barrier and provide a report on these investigations (including a recommendation as to the preferred option) to the Department and DNR within 6 months. The Department, in consultation with DNR, would then be able to consider the best design for the barrier, prior to the Applicant proceeding with its construction.

Final Voids

When mining in the Carrington Pit is complete, pit reshaping and revegetation would be undertaken. Water levels in the final void would then begin to recover and waste rock spoils within the void would resaturate. MER's computer simulations indicate groundwater levels within the mine pit would be slow to recover, taking more than 100 years. The SEE identifies two scenarios for pit closure design. These are:

- an ***open water void*** above emplaced materials that would generate an evaporative sink over an elevation range of 40 to 45 metres AHD, and

- a **filled, reshaped pit** without an open water void but with a depression designed to facilitate evapo-transpiration at an elevation above 45 metres AHD.

MER's simulations indicate that the equilibrated level for an open water void is below the prevailing river level. This level is influenced by a combination of direct rainfall to the open void, rainfall infiltration-percolation through spoils, a small component of upward groundwater seepage from the coal measures, and evaporative losses from the open water surface. The pit shell outside the void would be filled above ground level and reshaped while within the open void it would be filled to a nominal elevation of about 40 metres AHD (18 to 20 metres below river level) or lower. This scenario ensures an evaporative sink when water levels rise above 40 metres AHD, providing that sufficient water surface area is generated within the shaped void for evaporative losses to balance overall void influxes. The evaporative sink would then result in a continuing hydraulic grade towards the void. However, the void would then act as an evaporative concentrator leading to an increased salinity in the void waters.

For a final pit configuration with no open water, spoils would be emplaced to 45 metres AHD. Extensive tree planting would be undertaken using species with high transpiration rates to maintain the void water level below ground level. The advantage of this approach is a significantly reduced tendency for evaporative concentration of salts over time. However, there is a very long time frame before water levels would recover to the design elevation, during which time tree species would need to be maintained and regenerated.

Leachate generated by water-rock interactions within the final void would be contained within the void. Water quality is predicted to be in the range 4000 to 6000 mg/l total dissolved solids. Salt species are predicted to be dominated by bi-carbonate ions – Na>Mg>Ca and HCO₃>Cl>SO₄. This range of dissolved solids is similar to that currently prevailing within the palaeochannel.

The SEE seeks consent for the relocation of the proposed final void to the north and its modification to perform as an evaporative sink. However, detailed location and design elements are not provided. Instead, dimensions and design are proposed to be determined from further groundwater modelling and final location and design then submitted to relevant regulatory authorities for approval (i.e. the Department, DNR and DPI) prior to construction.

The Applicant's Response to Submissions has since indicated that its preferred option is the open water void. However, the Department considers that the second option, involving no open water void, deserves further assessment. An evapo-transpiratory solution to mine void salinisation problems offers long term benefits to both the environment and the community (i.e. inter-generational benefits). The Department accepts that insufficient research has been done to date to support firm adoption of the second option as the preferred solution at Carrington. However, further assessment and development of the options offers potential for greatly improved sustainability outcomes both at Carrington and elsewhere in the Hunter Valley.

Consequently, the Department believes the Applicant should be required to prepare Final Void Management Plans at least 5 years prior to mining ceasing (or as otherwise agreed with the Director-General) to further assess locations, designs and final land use options for each final void proposed at HVO North.

The Applicant has proposed the continuation of all existing groundwater monitoring and management measures as well as the adoption of a number of additional measures and further measures to be adopted should defined triggers be exceeded (see p. 41 of the SEE). These measures are supported. The Department is generally satisfied with the

Applicant's ground water assessment and considers that the measures proposed by the Applicant are appropriate, subject to the additional conditions proposed regarding the groundwater barrier wall and the design parameters for the final void.

5.2 Surface Water

Flooding

With the Carrington Pit located north of the Hunter River there is a potential that extreme rainfall events may lead to floodwaters entering the pit. Two levees are proposed to protect the open cut and divert floodwaters. Levee 5 is a large levee to be located along the southern boundary of the extension. Levee 5A is a much smaller levee filling a gully to the northwest of Levee 5 (see Figure 2). The levees have been designed to protect the mine from a 100 year ARI flood event, with a minimum freeboard of 1 metre. This equates to a 185 year ARI flood event.

The impact of the proposed levees on the Hunter River and its floodplain was assessed by Lyall and Associates Consulting Water Engineers (see Annex C to the SEE). This assessment indicated that the proposed levees would be outside the main passage of flow, and their main impact would be a local redirection of flows from the northern floodplain towards the channel. This would be accompanied by small increases in velocity, which would not have a significant effect on the morphology of the river channel. The modelled increases in flood level would reach a maximum of 60 mm upstream of Levee 5, but at most locations, the modelled change in flood level is smaller and probably within the accuracy of the hydraulic model.

The Department is satisfied with the Applicant's flood assessment, and is confident that the proposed modification would not appreciably increase flood levels or flow velocities in the areas surrounding the mine.

Other Surface Water Impacts

Surface water impacts other than flooding were assessed by MER (see Annex D to the SEE). Surface water related studies included an assessment of changes to the runoff regime and a review of mine water management systems.

The proposed extension would temporarily remove catchment runoff from about 60 ha around the east arm of the palaeochannel. This runoff currently enters an un-named drainage and either recharges the alluvium or flows into the Hunter River via a billabong. The runoff would be restored by 2014 following reshaping of spoils and the final void area. However, the final void may also attract runoff from an area as large as 290 ha resulting in long term loss (of runoff) to the river. For median conditions and typical catchment parameters this would equate to about 109 ML/annum or 0.4% of the tenth percentile regulated (low) flow in the river.

Review of the mine water management system indicates a small deficit during dry and drought periods due to the relatively low rates of seepage to the mine pit. This deficit is currently met through staging storage within the Applicant's water sharing system which links operations between West Pit, North Pit and South Pit. A surplus is expected to prevail during wet years. This surplus can also be managed through the available storage. There would be no significant change in pit water seepage or runoff entering Carrington Pit for the proposed extension. Dam 9N, which currently receives all pumped water from the mine pit, would be relocated to the southeast. The dam would continue to receive pit water. Sedimentation Dam 12N would be destroyed (as originally planned) without impact on the mine water system. Sedimentation Dam 13N would be enlarged following closure and a number of additional temporary sedimentation dams constructed to manage runoff from the final landform.

A small billabong of the Hunter River located south of the proposed extension is an important local surface water feature. Because of its particular habitat features, this billabong is addressed under Flora and Fauna below.

The Applicant proposes to maintain the existing environmental monitoring programme throughout the mine life and following closure. Monitoring would include routine measurement of surface water pumpage, storage and water quality parameters in accordance with current schedules.

The Department is satisfied with the Applicant's surface water assessment, and considers that the proposed extension would not significantly increase the surface water impacts of the existing operations at HVO North. The Department also considers that the existing management and monitoring measures which the Applicant proposes to also apply within the extension area are acceptable, and would achieve appropriate outcomes. Consequently, the Department does not believe that measures additional to those already being implemented at HVO North are required for the development.

5.6 Flora and Fauna

The small billabong located south of the proposed extension is an important local surface water feature (see Figures 3 and 4). The billabong supports a substantial surrounding population of 33 mature river red gums (*Eucalyptus camaldulensis*) covering some 0.4 ha. This species is listed as an endangered population throughout the Hunter Catchment under the *Threatened Species Conservation Act 1995*, with only 19 stands totalling some 15 – 20 ha known to remain. The billabong and river red gums are located on land owned by the Applicant.

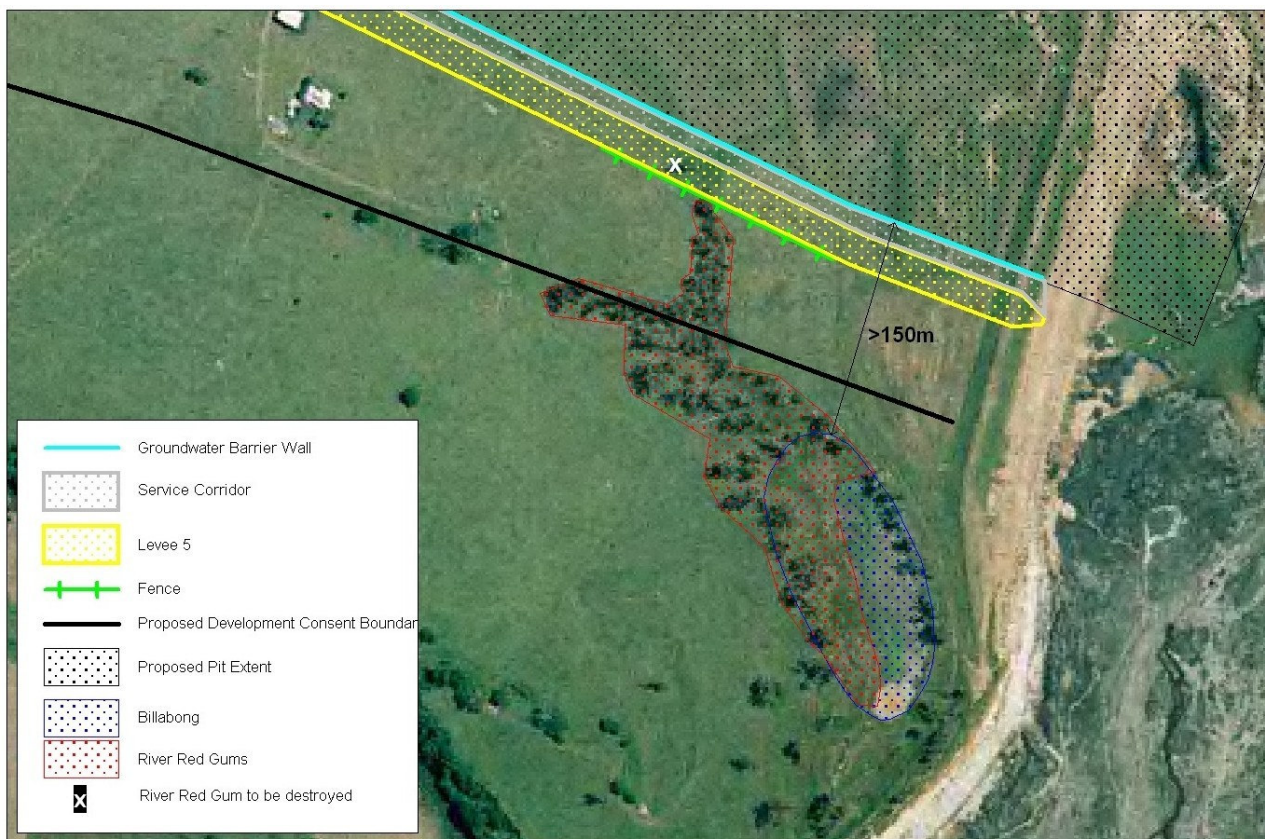


Figure 4: Carrington River Red Gums, Billabong and Groundwater Barrier Wall

The SEE's Ecology Assessment (see Annex H) reports that the river red gums are suffering from various stages of dieback, with a high proportion (22%) of standing dead (i.e. stag) trees. This in turn leads to a high number of tree hollows (86 recorded) which are useful habitat for birds, bats and tree-dwelling mammals. The SEE has suggested that dieback of the river redgums may in part be associated with the dewatering of the Carrington Pit (see Annex H). Other factors are likely to be the current drought and a likely reduction in the size and number of Hunter River floods over the past 50 years due to increased pumping. The SEE reports that, since 2001, pit dewatering has lowered the water table at the billabong by 2 – 3 metres. When inspected, the billabong was dry and its surface was dominated by exotic weeds (see Figure 5 and Annex C to the SEE).



Figure 5: Carrington Billabong and River Red Gums, looking south.
(Note dry condition, weeds and dieback)

Since the groundwater level is already close to the river level, and a barrier wall is proposed as a condition of consent, dewatering is unlikely to further impact on the billabong. However, given the lowered water table, it can be expected that the billabong would remain dry until the next major flood event, which may be some years.

The Applicant has agreed to requests from DNR that the pit highwall be separated from the standing water line of the billabong by a buffer of 150 metres. It is proposed that Levee 5, a services corridor and a fence would be constructed close to the highwall within this buffer (see Figure 4). Careful location of the levee and the services corridor would result in the destruction of a single mature tree from the upstream edge of the red gum population.

Given the regional significance of the red gum population, the existing impacts of dewatering on the billabong, the poor condition of both the billabong and the red gums, and that the Applicant owns the land, the Department believes that there is an outstanding

opportunity for a regionally-significant ecosystem restoration and rehabilitation program. It is clear that such a program needs to address the fundamentals underpinning the health and sustainability of the billabong and the red gums, such as surface water, groundwater and ecosystem re-establishment, as well as lesser matters such as weeds, exclusion of cattle and fencing.

A condition of consent has therefore been proposed which requires the Applicant to develop a comprehensive rehabilitation and restoration program for the billabong and river red gum population.

The remainder of the proposed 60 ha southern extension has been highly modified through clearing and grazing and is predominantly pasture. The 80 ha eastern extension comprises an overburden dump which has been recently rehabilitated for grazing. There is also a small remnant stand of about 20 native trees predominantly comprising Grey Box and Narrow-Leaved Ironbarks (mapped as Grey Box/Narrow-leaved Ironbark/Bulloak Woodland) located west of the existing pit in the area previously proposed to become Levee 6. It is now proposed that this area, which is otherwise dominated by pasture and weed species, would be mined through. The Department is satisfied that this would not result in any significant flora and fauna impacts.

The Applicant has previously indicated that it is developing a strategy to assess green offset options for all of its operations at the HVO mining complex. The Department supports this initiative, and has recommended a condition which requires the submission of a green offset strategy for HVO North within the next 12 months. It is planned that the billabong and red gum rehabilitation and restoration program would become a key element of this offset program.

The Department is satisfied with the Applicant's ecological assessment. The SEE and a Statement of Commitments since prepared by the Applicant propose the adoption of a number of management and mitigation measures to reduce the impacts of the extension. The Department considers that these existing and proposed measures are acceptable, and would achieve appropriate outcomes in the extension area. Consequently, the Department does not believe that measures additional to those proposed by the Applicant are required for the development, other than the matters addressed above.

5.3 Noise and Vibration

An assessment of the potential noise impacts associated with the Carrington Extension was undertaken by ERM (see Annex E of the SEE). The assessment methodology was consistent with that used in the West Pit consent and reviewed noise and vibration impacts from HVO North including contributions from the Carrington Extension. It considered the years 2006, 2011 and 2014. The modelling was conservative (all equipment and plant operating simultaneously and at full power) and addressed cumulative impacts (i.e. contributions from other sources). Noise and vibration were assessed against the relevant limits specified in the West Pit consent.

The noise modelling has shown that under the DEC's Industrial Noise Policy assessable weather conditions the great majority of private residences not currently located within a zone of affectation continue to experience noise levels below the existing consent limits. The exceptions are properties 1 to 4 (Hayes, Skinner, Gee and Muller) where noise is predicted to be marginally (1 or 2 dB(A)) above intrusive noise limits in the initial stages of mining.

However, the Applicant argues that the noise assessment is very conservative, and is confident that it can modify its operations to reduce noise levels to comply with the noise criteria. The Department accepts this argument, and provided the noise impacts of the

development are monitored in accordance with its approved Noise Monitoring Program, the Applicant would be able to identify elevated noise levels, and modify its operations to ensure compliance with the noise criteria in the existing conditions of consent.

Two other properties (8 (Holz) and 10 (Moses)) are already subject to acquisition on request under the West Pit consent due to excessive noise impacts. Not surprisingly, these properties remain similarly affected by intrusive noise (INP assessable weather, night) with the extension taken into consideration. The Holz property is also affected under sleep disturbance criteria (INP assessable weather, night).

Consequently, the proposed modification would have substantially the same noise impacts as the approved development, providing that mitigation measures reduce potential impacts on properties 1 to 4 when required.

Modelling of impacts from proposed blasting indicated that the existing consent limits for noise overpressure and ground vibration would be achieved at all private residential locations for the life of the extension.

The Department is satisfied with the Applicant's noise impact assessment, and believes that the proposed extension is unlikely to significantly alter the noise levels from the existing mining operations at HVO North. Consequently, the Department is satisfied that no additional management or monitoring requirements over and above those already being implemented by the Applicant are warranted.

5.4 Dust

An assessment of the potential air quality impacts associated with mining in the proposed extension was undertaken by Holmes Air Sciences (HAS, see Annex F of the SEE). The assessment methodology was consistent with that used in the West Pit consent and reviewed air quality impacts from HVO North including the contribution from the Carrington Extension. It considered the years 2006, 2011 and 2014 and used the short-term industrial source complex model (ISC3-ST – Version 03025). The modelling also addressed cumulative impacts (i.e. contributions from other sources)

The modelling demonstrates that dust emissions from HVO North *alone* (including the proposed extension) would not exceed DEC air quality criteria. However, the modelling did indicate some high *cumulative* annual average PM₁₀ results, particularly for property 8 (Holz). These predictions are 28.6 µg/m³ in 2006; 33.1 µg/m³ in 2006 and 35.6 µg/m³ in 2014, against a 30 µg/m³ goal. The Holz property is already in the acquisition zones for all mines which contribute significantly to its impacts from dust (i.e. HVO North, HVO South and Ravensworth West).

A very minor exceedance of the same annual average PM₁₀ criteria is also predicted in 2011 for property 39 (Kanaar, 30.1 µg/m³). However, this property is located in the acquisition zone for the Wambo coal mine, and the Department believes that dust concentrations in this area would be dominated by the Wambo mine. Given this, and the very minor predicted exceedance, the Department considers that it would not be appropriate to include this property in HVO's acquisition zone.

In summary, the Department is satisfied with the Applicant's air quality impact assessment, and that the proposed extension would not appreciably increase the dust impacts of the existing operations. The Department is also satisfied that no additional management or monitoring requirements over and above those already being implemented by the Applicant at the site are warranted.

5.5 Land Acquisition

The 2004 West Pit consent requires property acquisition based on “current market value at the date of the written request [from the landowner] as if the land was unaffected by the development the subject of the DA”. The major consent for HVO South (the South Pit consent) has recently been modified to ensure that, in the case of properties which are seriously impacted by noise and/or dust from more than one mine, that the impacts on market value of the whole HVO Mining Complex (i.e. both HVO South and HVO North) are removed from the calculation of the acquisition price.

It is proposed that the West Pit consent be similarly amended.

5.6 Aboriginal Cultural Heritage

An assessment of the impacts of the proposed extension on Aboriginal heritage was conducted by ERM (see Annex G to the SEE). Ten previously unrecorded sites were found during the survey: 7 artefact scatters, 2 isolated finds and 1 scarred tree. Three previously recorded sites were relocated but another 2 could not be found. A total of 78 artefacts were recorded during the survey.

Nine of the identified sites would be directly impacted by the proposed extension. However, these sites were assessed as having low to moderate archaeological significance, and the Applicant proposes to undertake further archaeological investigations prior to mining through these areas.

The most significant site in the study area is the previously-recorded site CM-CD1, and the Applicant is proposing to maintain a buffer zone of 15 metres around this site (and 2 associated sites - CM1 and part of CM2) to ensure they are appropriately protected from mining. While this buffer area is less than originally approved (15 metres compared with 60 metres), the Department believes that the proposed buffer distance would provide adequate protection for these sites.

The Applicant is also proposing to remove and relocate a scarred tree which would be impacted by mining to a site where it would be protected from further development, with site selection in consultation with the local Aboriginal community.

The Department is generally satisfied with the Applicant’s Aboriginal heritage assessment, and believes that the proposed extension is unlikely to result in any significant impacts on Aboriginal heritage in the area. The Department is also satisfied with the Applicant’s proposed measures to mitigate and manage impacts – a view supported by the DEC.

6. OTHER ISSUES

Non-Aboriginal heritage in the southern extension was assessed by ERM. The results of the site survey, database and map searches, and consultation indicate that there would be no significant impacts to historical archaeology in the area of the extension.

A **visual amenity** assessment was also undertaken by ERM. Property 10 (Moses) is located on a ridge line southwest of the Carrington Pit, and has distant views of both this pit and also the nearby North Pit. The visual sensitivity is judged in the SEE to be low, and this seems particularly so since the proposed extension is simply an expansion of one of several existing visible pits. The Moses property is also already subject to acquisition on request.

Soils and land capability for the southern extension area were assessed by Global Soil Systems Environmental. The proposed extension would impact on 3.8 ha of land with Class II agricultural land capability, with a small section of this to be mined through and the balance to be covered by Levee 5. It is proposed in the SEE that, following completion of mining, the Levee would be removed and the Class II land rehabilitated in accordance with methods used for the HVO alluvial lands development. Consequently, the links between rehabilitated and undisturbed Class II land would be re-established.

The proposed extension would have no direct impact on **traffic and transport** as all coal would be transported on internal haul roads, there would be no change in the number of employees, and no change in the total tonnage of coal produced in any one year. However, the Hunter Regional Development Committee sought on behalf of the RTA that the consent be modified to require the Applicant to submit a road safety audit to the RTA concerning public roads used by mine employees and service vehicles. The Department has incorporated the RTA's recommended conditions in the instrument of modification.

7. RECOMMENDED CONDITIONS OF CONSENT

The Department has prepared recommended conditions of consent for the proposed modification (see Tag A). The proposed extensions generally would have low impacts which would be managed appropriately by the existing framework of conditions. However, particular impacts are more significant, and it is therefore proposed to include appropriate conditions to require:

- all options for construction of a groundwater barrier wall to be fully examined and a preferred option reported to the Department and DNR within 6 months;
- a groundwater barrier wall to be constructed across the eastern arm of the palaeochannel within 2 years;
- design options for the final void to be further assessed, and void location, design and function to be finalised to the satisfaction of the Director-General following consultation with relevant agencies;
- a comprehensive rehabilitation and restoration program to be prepared for the billabong and red gum population (addressing groundwater, surface water and other appropriate management measures);
- a comprehensive landscape and rehabilitation management strategy for HVO North, including measures to offset the impacts of the development on flora and fauna;
- a road safety audit for HVO North as requested by the RTA; and
- improved access for the community to environmental management, monitoring and reporting information through the posting of specified documents to the Applicant's website.

The Applicant has accepted the proposed modified conditions of consent.

8. CONCLUSION

The Department has reviewed the modification application, SEE and submissions on the proposal. It has assessed the environmental impacts of the proposal, which is a minor (140 ha) extension to a large existing and approved mining complex (5,200 ha approved mining area). The environmental impacts of the proposal are limited and, subject to the conditions proposed, do not increase the environmental impacts of the development already approved under the West Pit consent (DA 450-10-2003).

The extension would result in HVO having access to an additional 19 million tonnes of ROM coal. This resource would further enhance the economic viability of HVO and provide ongoing employment to the local community and royalties to the NSW Government.

The Department is satisfied that the site is suitable for the development. The Applicant has committed to the development of a groundwater barrier wall, a rehabilitation and restoration program for the billabong and red gum population, and a comprehensive green offset strategy for all of HVO North. Based on its assessment, the Department considers that the proposal is in the public interest, and should be approved subject to conditions (see Tag A).

9. RECOMMENDATION

It is RECOMMENDED that the A/Executive Director, as delegate for the Minister:

- consider the findings and recommendations of this report;
- determine that the development consent, as modified, would relate to substantially the same development for which consent was originally granted;
- approve the proposed modification under section 96(2) of the EP&A Act; and
- sign the attached notice of modification (Tag A).

Mike Young
Manager
Mining & Extractive Industries

David Kitto
A/Director
Major Development Assessment

Chris Wilson
A/Executive Director
Sustainable Development Assessments

APPENDIX 1

ASSESSMENT AGAINST ENVIRONMENTAL PLANNING INSTRUMENTS

State Environmental Planning Policy 11 – Traffic Generating Development

The proposal is affected by the provisions of SEPP 11, as an “extractive industry or mining” (Schedule 1(m)). However, the proposed expansion would not generate additional traffic nor change existing access to the mine. Nonetheless, the application was referred to the RTA. The HRDC response confirmed that it had no objection to the proposal in principle, but made a number of requests on behalf of the RTA (see section 4).

State Environmental Planning Policy 44 – Koala Habitat Protection

The fauna studies undertaken as part of the ecology assessment for the SEE did not identify any koalas in the area of the extension or the immediate surrounds. There are no DEC or ERM records of koalas within a 10 km radius of the extension. As such, the Department is satisfied that the proposal is generally consistent with the aims, objectives, and requirements of SEPP 44.

Hunter Regional Environmental Plan 1989

The Hunter REP sets a policy framework for development in the Hunter Region between 1989 and 2009. The plan guides the processing of DAs in accordance with regional objectives. The sections of the Hunter REP with relevance to coal mining include:

- Division 1 of Part 4 (regarding the protection of prime crop and pasture land);
- Division 1 of Part 5 (encouraging the transport of coal by rail where practicable);
- Division 1 of Part 6 (matters that consent authorities must consider when considering applications for mining); and
- Division 1 of Part 7 (regarding pollution control, including air, noise and water pollution).

The SEE accompanying the modification has considered each matter of relevance under the REP (see pp A7-A8). The Department has also considered each of those matters and is satisfied that the development can be conducted in a manner which is consistent with the objectives and requirements of the REP.

Singleton Local Environmental Plan 1996

The Carrington extension area is zoned Rural 1(a) under the Singleton LEP. Within this zone, mining is permissible with development consent. One of the objectives of the Rural 1(a) zone is "*To allow mining where environmental impacts do not exceed acceptable limits and the land is satisfactorily rehabilitated after mining*".

The proposed development is therefore permissible with consent and is generally consistent with the objectives of the zone.
