



WAMBO COAL PTY LTD

NORTH WAMBO UNDERGROUND MINE MODIFICATION ENVIRONMENTAL ASSESSMENT

ATTACHMENT 2

RELEVANT ENVIRONMENTAL PLANNING INSTRUMENTS AND GOVERNMENT POLICIES

A2 PLANNING FRAMEWORK

This Attachment provides further discussion on the requirements and application of environmental planning instruments and relevant NSW government policy to the Modification.

References to Sections 1 to 5 in this Attachment are references to the sections of the Main Report of the EA. Internal references within this Attachment are prefixed with “A2”.

A2.1 SINGLETON LOCAL ENVIRONMENTAL PLAN 1996

Wambo is wholly within the Singleton LGA (Figure 1). The following sub-sections identify the provisions in the Singleton LEP which have relevance to the Modification.

Clause 16(3) of the Singleton LEP relevantly provides:

- (3) *Except as otherwise provided by this plan, the Council shall not grant consent to the carrying out of development on land to which this plan applies unless the Council is of the opinion that the carrying out of the development is consistent with one or more of the objectives of the zone within which the development is proposed to be carried out.*

Wambo lies wholly within land zoned “Rural Zone” (Zone 1[a]). Under the Singleton LEP the objectives of the Rural Zone are:

- (a) *to protect and conserve agricultural land and to encourage continuing viable and sustainable agricultural land use,*
- (b) *to promote the protection and preservation of natural ecological systems and processes,*
- (c) *to allow mining where environmental impacts do not exceed acceptable limits and the land is satisfactorily rehabilitated after mining,*
- (d) *to maintain the scenic amenity and landscape quality of the area,*

- (e) *to provide for the proper and co-ordinated use of rivers and water catchment areas,*
- (f) *to promote provision of roads that are compatible with the nature and intensity of development and the character of the area.*

Under the Singleton LEP “coal mining” is permissible on lands in the Rural Zone with development consent as coal mining is not listed as being a prohibited use in the zoning table in Part 3.

A2.2 STATE ENVIRONMENTAL PLANNING POLICIES

Hunter Regional Environmental Plan (Heritage) 1989

Clause 5 of the Singleton LEP excludes the Singleton LGA from the Hunter REP (Heritage). All items of local, regional and State significance contained within the Hunter REP (Heritage) are listed in Schedule 3 of the Singleton LEP.

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

The Mining SEPP regularises the various environmental planning instruments that previously controlled mining activities.

Clause 5(3) of the Mining SEPP gives it primacy where there is an inconsistency between the provisions of the Mining SEPP and the provisions of any other environmental planning instrument (except the *State Environmental Planning Policy (Major Development) 2005*, *State Environmental Planning Policy No. 14 [Coastal Wetlands]* and *State Environmental Planning Policy No. 26 [Littoral Rainforest]*).

Clause 2

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

- (a) *to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and*
- (b) *to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources, and*

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

Clause 7

Clause 7(1) of the Mining SEPP states that development for any of the following purposes may be carried out only with development consent:

- (a) *underground mining carried out on any land,*
- (b) *mining carried out:*
 - ...
 - (ii) *on land that is, immediately before the commencement of this clause, the subject of a mining lease under the Mining Act 1992 or a mining licence under the Offshore Minerals Act 1999,*

The Modification comprises mining within existing Wambo mining and coal leases (Figure 2).

Clause 12

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

- (a) *consider:*
 - (i) *the existing uses and approved uses of land in the vicinity of the development, and*
 - (ii) *whether or not the development is likely to have a significant impact on the uses that, in the opinion of the consent authority having regard to land use trends, are likely to be the preferred uses of land in the vicinity of the development, and*
 - (iii) *any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses, and*
- (b) *evaluate and compare the respective public benefits of the development and the land uses referred to in paragraph (a) (i) and (ii), and*
- (c) *evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a) (iii).*

Land use in the vicinity of Wambo is characterised by a combination of coal mining operations, agricultural land uses and the village of Warkworth. Land use in the Modification longwall panel area includes areas of vegetation and cleared grazing land and is wholly located on WCPL-owned land.

The potential impacts of the Modification on existing agricultural improvements, mining-related infrastructure and vegetation as a result of mine subsidence are described in Appendices A, D and F and summarised in Sections 4.2, 4.3 and 4.8.

The Modification would not result in additional noise and air quality impacts to adjoining land users as it would use the current North Wambo Underground Mine major surface infrastructure and would not alter the operation of the mine (Section 4.1).

The Modification would allow for the extraction of additional coal reserves adjoining the existing North Wambo Underground Mine that can be economically mined with underground mining methods.

WCPL would, where practicable, implement a range of measures to avoid or minimise incompatibility of the Modification with existing and future land uses in the Modification longwall panel area. This would be achieved through the implementation of the existing Wambo environmental management system.

Clause 14

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

- (a) *that impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimised to the greatest extent practicable,*
- (b) *that impacts on threatened species and biodiversity, are avoided, or are minimised to the greatest extent practicable,*
- (c) *that greenhouse gas emissions are minimised to the greatest extent practicable.*

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

The potential impacts of the Modification on groundwater and surface water resources are discussed in Sections 4.4 and 4.5, including measures to minimise potential impacts which are described in Sections 4.4.2 and 4.5.2. The potential impacts of the Modification on threatened species and biodiversity are described in Sections 4.8 and 4.9, including measures to minimise potential impacts which are described in Sections 4.8.2 and 4.9.2.

Existing Wambo greenhouse gas abatement measures and the Modification greenhouse gas emissions estimate are described in Section 4.10.1. This section of the EA provides a quantitative assessment of potential scope 1, 2 and 3 greenhouse gas emissions of the Modification.

Clause 15

Clause 15 of the Mining SEPP requires that:

- (1) *Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider the efficiency or otherwise of the development in terms of resource recovery.*
- (2) *Before granting consent for the development, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at optimising the efficiency of resource recovery and the reuse or recycling of material.*
- (3) *The consent authority may refuse to grant consent to development if it is not satisfied that the development will be carried out in such a way as to optimise the efficiency of recovery of minerals, petroleum or extractive materials and to minimise the creation of waste in association with the extraction, recovery or processing of minerals, petroleum or extractive materials.*

The Modification would allow for the extraction of additional coal reserves adjoining the existing North Wambo Underground Mine that can be economically mined with underground mining methods. It is in WCPL's financial interest to maximise the efficiency of coal recovery and minimise the generation of coal reject which requires disposal.

Clause 16

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

- (a) *require that some or all of the transport of materials in connection with the development is not to be by public road,*
- (b) *limit or preclude truck movements, in connection with the development, that occur on roads in residential areas or on roads near to schools,*
- (c) *require the preparation and implementation, in relation to the development, of a code of conduct relating to the transport of materials on public roads.*

The primary public road network transport routes to and from Wambo include routes that are adjacent to rural areas, industrial/commercial areas, residential areas and schools.

Wambo product coal would continue to be transported from site by rail.

As the maximum production rate at Wambo would not change as a result of the Modification and the Modification would not result in any additional demand for employees/contractors, there would be no change in the vehicle movements associated with consumable deliveries or employee and contractor vehicle movements to Wambo.

Given the above, it is considered the Modification would not result in any significant changes to the potential road transport impacts of Wambo.

Clause 17

Clause 17 of the Mining SEPP requires that before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the approval should be issued subject to conditions aimed at ensuring the rehabilitation of land that will be affected by the development. In particular, the consent authority must consider whether conditions of the consent should:

- (a) *require the preparation of a plan that identifies the proposed end use and landform of the land once rehabilitated, or*
- (b) *require waste generated by the development or the rehabilitation to be dealt with appropriately, or*
- (c) *require any soil contaminated as a result of the development to be remediated in accordance with relevant guidelines (including guidelines under section 145C of the Act and the Contaminated Land Management Act 1997), or*
- (d) *require steps to be taken to ensure that the state of the land, while being rehabilitated and at the completion of the rehabilitation, does not jeopardize public safety.*

At the cessation of the Modification (i.e. completion of mining Longwalls 9 and 10), a comprehensive programme would be implemented for the rehabilitation of the Modification longwall panel area (Section 3.9). The proposed management of coal reject material is discussed in Section 3.5 and the management of other wastes is described in Section 2.6. One of the key Wambo rehabilitation objectives is the creation of safe, stable, adequately drained post-mining land that is consistent with the surrounding landscape (Section 2.11).

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

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

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

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

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

Notwithstanding, environmental management plans and monitoring programmes would be reviewed, and if necessary, revised by WCPL to include the Modification and manage any associated environmental risks.

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

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

An assessment of potential and core Koala habitat was conducted in the EIS. This assessment concluded that lands within the vicinity of Wambo do not contain potential or core Koala habitat (WCPL, 2003). The provisions of SEPP 44 are therefore not considered to be applicable to the Modification.

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

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

A consent authority must consider the following under clause 7(1) of SEPP 55:

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

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

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

Because the Modification is within existing Wambo mining and coal leases, no change of use is proposed and no preliminary land contamination investigation is required.

A2.3 STRATEGIC REGIONAL LAND USE POLICY

As part of the Strategic Regional Land Use Policy, the NSW Government is introducing a 'Gateway Process' for the upfront assessment of the impacts of State Significant mining and coal seam gas proposal on Strategic Agricultural Land (NSW Government, 2012c).

The Modification area is wholly contained within existing Wambo mining leases, therefore the 'Gateway Process' will not apply to the assessment of the Modification (NSW Government, 2012c).

Strategic Agricultural Land as mapped in the Upper Hunter SRLUP is described in Section 4.3.1 and Appendix F and is presented in Figure 9. An assessment of potential impacts on agricultural land and resources is presented in Appendix F and summarised in Section 4.3.2.

An assessment against the provisions of the Aquifer Interference Policy is provided in Section A2.4.

A2.4 AQUIFER INTERFERENCE POLICY

Policy Overview

The NSW *Aquifer Interference Policy* (NSW Government, 2012b) (the AIP) has been developed by the NSW Government as a component of the NSW Government's Strategic Regional Land Use Policy. The AIP applies state wide and details water licence and impact assessment requirements.

The AIP has been developed to ensure equitable water sharing between various water users and proper licensing of water taken by aquifer interference activities such that the take is accounted for in the water budget and water sharing arrangements. The AIP will also enhance existing regulation, contributing to a comprehensive framework to protect the rights of all water users and the environment in NSW.

The *Water Management Act, 2000* (WM Act) defines an aquifer interference activity as that which involves any of the following:

- *the penetration of an aquifer;*
- *the interference with water in an aquifer;*
- *the obstruction of the flow of water in an aquifer;*
- *the taking of water from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations; and*
- *the disposal of water taken from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations.*

Examples of aquifer interference activities include mining, coal seam gas extraction, injection of water, and commercial, industrial, agricultural and residential activities that intercept the water table or interfere with aquifers (NSW Government, 2012b).

The AIP applies to all aquifer interference activities but has been developed in particular to address the following activities (NSW Government, 2012b):

- **mining activities** such as open cut voids, underground mine workings and the disposal of water taken from an aquifer including water taken as part of coal seam gas extraction;
- other **extractive industries**, such as sand and gravel extraction ... ;
- **coal seam gas activities**, including those related to both exploration and production;
- other large projects which require **dewatering** such as for the construction and maintenance of associated works, such as buildings, roads and other civil works;
- **injection works** used to transmit water into an aquifer; and
- activities with the potential to contaminate groundwater or result in unacceptable loss of storage or structural damage to an aquifer.

Licensing Requirements

The AIP requires all water taken by aquifer interference activities to be accounted for within the extraction limits set by the relevant Water Sharing Plan. A water licence is required, whether water is taken either incidentally or for consumptive use, where any act by a person carrying out an aquifer interference activity causes (NSW Government, 2012b):

- the removal of water from a water source; or
- the movement of water from one part of an aquifer to another part of an aquifer; or
- the movement of water from one water source to another water source, such as:
 - from an aquifer to an adjacent aquifer; or
 - from an aquifer to a river/lake; or
 - from a river/lake to an aquifer.

The AIP also requires consideration of the continued take of water from groundwater or connected surface waters following cessation of an aquifer interference activity. For example, the post-closure inflow that occurs until a groundwater system reaches equilibrium following cessation of open cut mining is required to be considered. Licences are required to be held to adequately account for the ongoing take of water until the system returns to equilibrium, or alternatively, sufficient licences are required to be surrendered to the Minister.

Minimal Impact Considerations

In addition to licensing requirements, the WM Act includes the concept of ensuring “no more than minimal harm”. In this regard the AIP includes minimal impact considerations relating to water table and groundwater pressure drawdown and changes in groundwater and surface water quality.

The AIP provides that:

Aquifer interference approvals are not to be granted unless the Minister is satisfied that adequate arrangements are in force to ensure that no more than minimal harm will be done to any water source, or its dependent ecosystems, as a consequence of its being interfered with in the course of the activities to which the approval relates.

While aquifer interference approvals are not required to be granted, the minimal harm test under the Water Management Act 2000 is not activated for the assessment of impacts. Therefore, this Policy establishes and objectively defines minimal impact considerations as they relate to water-dependent assets and these considerations will be used as the basis for providing advice to either the gateway process, the Planning Assessment Commission or the Minister for Planning.

The AIP establishes minimal impact considerations for groundwater categories of both “highly productive” and “less productive” groundwater. Highly productive groundwater is defined by the AIP as groundwater which (NSW Government, 2012b):

... is defined in this Policy as a groundwater source that is declared in the Regulations and will be based on the following criteria

- a) has total dissolved solids of less than 1,500 mg/L, and
- b) contains water supply works that can yield water at a rate greater than 5 L/sec.

The AIP further groups highly productive groundwater into the following categories:

- Alluvial.
- Coastal sands.
- Porous rock, including;
 - Great Artesian Basin – Eastern Recharge and Southern Recharge;
 - Great Artesian Basin – Surat, Warrego and Central; and
 - other porous rock.
- Fractured rock.

The AIP similarly defines categories for less productive groundwater which include:

- Alluvial.
- Porous rock.
- Fractured rock.

The minimal impact considerations developed for highly productive alluvial water sources and less productive porous and fractured rock water sources are summarised in Table A2-1.

Table A2-1
Minimal Impact Considerations for Aquifer Interference Activities

Water Source	Minimal Impact Consideration		
	Water Table	Water Pressure	Water Quality
Highly Productive Alluvial Water Sources	<p>1. Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic “post-water sharing plan” variations, 40 m from any:</p> <p>(a) high priority groundwater dependent ecosystem; or</p> <p>(b) high priority culturally significant site;</p> <p>listed in the schedule of the relevant water sharing plan; or</p> <p>A maximum of a 2 m decline cumulatively at any water supply work.</p> <p>2. If more than 10% cumulative variation in the water table, allowing for typical climatic “post-water sharing plan” variations, 40 m from any:</p> <p>(a) high priority groundwater dependent ecosystem; or</p> <p>(b) high priority culturally significant site;</p> <p>listed in the schedule of the relevant water sharing plan then appropriate studies will need to demonstrate to the Minister’s satisfaction that the variation will not prevent the long-term viability of the dependent ecosystem or significant site.</p> <p>If more than 2 m decline cumulatively at any water supply work then make good provisions should apply.</p>	<p>1. A cumulative pressure head decline of not more than 40% of the “post-water sharing plan” pressure head above the base of the water source to a maximum of a 2 m decline, at any water supply work.</p> <p>2. If the predicted pressure head decline is greater than requirement 1. above, then appropriate studies are required to demonstrate to the Minister’s satisfaction that the decline will not prevent the long-term viability of the affected water supply works unless make good provisions apply.</p>	<p>1. (a) Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 m from the activity; and</p> <p>(b) No increase of more than 1% per activity in long-term average salinity in a highly connected surface water source at the nearest point to the activity.</p> <p>Redesign of a highly connected surface water source that is defined as a “reliable water supply” is not an appropriate mitigation measure to meet considerations 1.(a) and 1.(b) above.</p> <p>(c) No mining activity to be below the natural ground surface within 200 m laterally from the top of high bank or 100 m vertically beneath (or the three dimensional extent of the alluvial water source - whichever is the lesser distance) of a highly connected surface water source that is defined as a “reliable water supply”.</p> <p>(d) Not more than 10% cumulatively of the three dimensional extent of the alluvial material in this water source to be excavated by mining activities beyond 200 m laterally from the top of high bank and 100 m vertically beneath a highly connected surface water source that is defined as a “reliable water supply”.</p> <p>2. If condition 1.(a) is not met then appropriate studies will need to demonstrate to the Minister’s satisfaction that the change in groundwater quality will not prevent the long-term viability of the dependent ecosystem, significant site or affected water supply works.</p> <p>If condition 1.(b) or 1.(d) are not met then appropriate studies are required to demonstrate to the Minister’s satisfaction that the River Condition Index category of the highly connected surface water source will not be reduced at the nearest point to the activity.</p> <p>If condition 1.(c) or (d) are not met, then appropriate studies are required to demonstrate to the Minister’s satisfaction that:</p> <ul style="list-style-type: none"> • there will be negligible river bank or high wall instability risks; • during the activity’s operation and post-closure, levee banks and landform design should prevent the Probable Maximum Flood from entering the activity’s site; and • low-permeability barriers between the site and the highly connected surface water source will be appropriately designed, installed and maintained to ensure their long-term effectiveness at minimising interaction between saline groundwater and the highly connected surface water supply.

Table A2-1 (Continued)
Minimal Impact Considerations for Aquifer Interference Activities

Water Source	Minimal Impact Consideration		
	Water Table	Water Pressure	Water Quality
Less Productive Porous and Fractured Rock Water Sources	<ol style="list-style-type: none"> Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic “post-water sharing plan” variations, 40 m from any: <ol style="list-style-type: none"> high priority groundwater dependent ecosystem; or high priority culturally significant site; listed in the schedule of the relevant water sharing plan; or <p>A maximum of a 2 m decline cumulatively at any water supply work.</p> If more than 10% cumulative variation in the water table, allowing for typical climatic “post-water sharing plan” variations, 40 m from any: <ol style="list-style-type: none"> high priority groundwater dependent ecosystem; or high priority culturally significant site; listed in the schedule of the relevant water sharing plan if appropriate studies demonstrate to the Minister’s satisfaction that the variation will not prevent the long-term viability of the dependent ecosystem or significant site. <p>If more than 2 m decline cumulatively at any water supply work then make good provisions should apply.</p> 	<ol style="list-style-type: none"> A cumulative pressure head decline of not more than a 2 m decline, at any water supply work. If the predicted pressure head decline is greater than requirement 1. above, then appropriate studies are required to demonstrate to the Minister’s satisfaction that the decline will not prevent the long-term viability of the affected water supply works unless make good provisions apply. 	<ol style="list-style-type: none"> Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 m from the activity. If condition 1 is not met then appropriate studies will need to demonstrate to the Minister’s satisfaction that the change in groundwater quality will not prevent the long-term viability of the dependent ecosystem, significant site or affected water supply works.

Source: Table 1, AIP (NSW Government, 2012b).

Aquifer Interference Policy Requirements

An assessment of the Modification against the licensing requirements and minimal impact considerations of the AIP is provided in the subsections below.

Licensing Requirements

As discussed above, the AIP requires all water taken by aquifer interference activities to be accounted for within the extraction limits set by the relevant Water Sharing Plan. The Water Sharing Plan relevant to the Modification is the *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009* (the HUAWSP). Therefore, licensing under the HUAWSP is required to account for any loss of flow to the alluvium resulting from the Modification. Licensing to account for water taken from the Permian system under the NSW *Water Act 1912* is also required.

Details of the current groundwater licences held by WCPL are summarised in Table A2-2. The predicted annual groundwater volumes required to be licensed for the approved operations and for the Modification are summarised in Table A2-3.

Table A2-2 indicates that WCPL currently hold licence entitlements of 70 megalitres per annum (ML/annum) for the HUAWSP and 1,516 ML/annum for water extracted from porous rock. Comparison of WCPL's licence entitlements against the predicted annual licensing requirements (Table A2-3) shows that adequate licences are available to account for the potential take of water associated with the approved operations and the Modification.

Post-closure annual licensing requirements are expected to be less than the licensing requirements during operation. Given WCPL currently hold adequate licenses to account for the potential take of water associated with the approved operations and the Modification it is expected WCPL will have adequate licences to account for the potential post-closure take of water.

Notwithstanding, the numerical groundwater model would be refined over progression of the mine life in order to more accurately calculate the post-closure licensing requirements associated with Wambo.

Table A2-2
Groundwater Licence Summary

Licence Number	Description	Facility	Valid to	Extraction Limits
Licences under the <i>Water Management Act, 2000</i> (Alluvial Aquifer)				
WAL 23897 ¹	Well No. 2	Well	Perpetuity	70 ML/year
Licences under the <i>Water Act, 1912</i> (Porous Rock Aquifer)				
20BL166910	Dewatering (Bore No. 1)	Bore	25/10/2018	450 ML/year
20BL167810	Well – Domestic, Stock	Well	Perpetuity	11 ML/year
20BL168017	Dewatering (Bore No. 2)	Bore	21/05/2012	750 ML/year
20BL168643	Dewatering Bore	Bore	7/08/2013	300 ML/year
20BL166438	Well - Stock	Bore	Perpetuity	5 ML/year

Source: Heritage Computing (2012).

¹ Assigned to the Lower Wollombi Brook Water Source.

Table A2-3
Groundwater Licensing Requirement Summary

Water Sharing Plan	Management Zone/ Groundwater Source	Predicted Annual Inflow Volumes Requiring Licensing (ML/annum)	
		Currently Approved	Modification
<i>Hunter Unregulated and Alluvial Water Sources Water Sharing Plan 2009</i>	Lower Wollombi Brook	Average 3.36	Average 3.45
<i>Water Act, 1912</i>	Porous Rock	Average 223 Maximum 548	Average 241 Maximum 617

Source: After Heritage Computing (2012).

Minimal Impact Considerations

As discussed above, the AIP establishes minimal impact considerations for highly productive and less productive groundwater. Figure 9 indicates the mapping of highly productive groundwater in the vicinity of the Modification.

No differentiation between highly productive and less productive groundwater or verification of the mapped highly productive groundwater has been undertaken as part of this assessment. Therefore the impacts of the Modification to the alluvium associated with North Wambo Creek and Wollombi Brook have been conservatively assessed against the minimal impact considerations relating to highly productive groundwater. The impacts of the Modification to porous rock have been assessed against the criteria for less productive groundwater.

North Wambo Creek and Wollombi Brook Alluvium Water Table and Water Pressure Minimal Impact Considerations

The water table minimal impact considerations for aquifer interference activities within highly productive alluvial water sources are presented in Table A2-1 and include:

- impacts to high priority groundwater dependent ecosystems;
- impacts to high priority culturally significant sites; and
- water decline at any water supply work.

In addition, the water pressure minimal impact considerations for aquifer interference activities within highly productive alluvial water sources are also presented in Table A2-1 and include a maximum 2 m decline at any water supply work.

The closest high priority groundwater dependent ecosystem in the Hunter Unregulated and Alluvial Water Sources as listed in Schedule 4 of the HUAWSP is located more than 55 km from Wambo, outside of the extent of cumulative drawdown associated with the Modification. Further to this, no high priority culturally significant sites are listed in the Schedule of the HUAWSP.

In addition, Heritage Computing (2012) predicted that no privately owned registered bores in alluvium would incur more than 0.1 m incremental drawdown due to the Modification.

Given the above, it is assessed that the Modification adequately satisfies the water table and water pressure minimal impact considerations relating to highly productive alluvial water sources defined in the AIP and outlined in Table A2-1.

Notwithstanding, in accordance with the Surface and Groundwater Response Plan (WCPL, 2010g) an investigation would be undertaken in the event that any unforeseen surface or groundwater impacts are detected or a complaint is received in relation to loss of groundwater supply. If the investigation identifies actual groundwater impacts attributable to WCPL activities, appropriate measures (e.g. provision of alternative water supply or bore reconditioning) will be developed and implemented in consultation with relevant authorities (e.g. DP&I and NOW) and any affected adjacent landowners (WCPL, 2010g).

Porous Rock Water Table and Water Pressure Minimal Impact Considerations

The water table minimal impact considerations for aquifer interference activities within less productive porous rock water sources are presented in Table A2-1 and include:

- impacts to high priority groundwater dependent ecosystems;
- impacts to high priority culturally significant sites; and
- water decline at any water supply work.

Water pressure minimal impact considerations for aquifer interference activities within less productive porous rock water sources are also presented in Table A2-1 and include a maximum of a 2 m decline at any water supply work.

No Water Sharing Plan has been developed for the Permian groundwater system, however, it is noted that the high priority groundwater dependent ecosystems listed in the HUAWSP are located outside the extent of the cumulative drawdown associated with the Modification. In addition no high priority culturally significant sites are listed in the HUAWSP.

Further, no privately owned registered bores would incur more than 1 m incremental drawdown due to the Modification (Heritage Computing, 2012). Therefore the Modification is considered to adequately satisfy the water table and water pressure minimal impact considerations relating to less productive porous rock water sources defined in the AIP and outlined in Table A2-1.

North Wambo Creek and Wollombi Brook Alluvium Water Quality Minimal Impact Considerations

The water quality minimal impact considerations for aquifer interference activities within highly productive alluvial water sources are presented in Table A2-1 and include:

- impacts to groundwater quality in relation to the beneficial use category of the groundwater source;
- impacts to the long-term average salinity in highly connected surface water sources;
- consideration of the location of mining activities in relation to a highly connected surface water source defined as a “reliable water supply” (i.e. Wollombi Brook); and
- limits to the extent of excavation of alluvial material.

The Modification is located approximately 450 m from Wollombi Brook at its closest point and therefore would not result in a mining activity below the natural ground surface within 450 m of Wollombi Brook. In regard to underground mining proximal to Wollombi Brook the EIS states (WCPL, 2003):

Mining of the longwall panels would be constrained by the subsidence exclusion zone limited to an angle of 26.5 degrees from the vertical to “Protected Land” (i.e. within 40 m of Wollombi Brook in accordance with the Rivers and Foreshore Improvement Act, 1948).

The Modification is located outside of this subsidence exclusion zone.

Further, the predicted additional 20 mm subsidence contour resulting from the Modification is located outside of the estimated limit of alluvium for Wollombi Brook (MSEC, 2012) and the Modification would not result in extraction of alluvial material.

As the Modification is not predicted to result in groundwater flux from the Permian to the alluvium, and would not involve extraction of alluvial material, no impact on alluvial water quality is expected. Therefore the Modification is not expected to result in a change of the beneficial use category of the alluvial groundwater.

The approved North Wambo Underground Mine will result in a slight increase in leakage from Wollombi Brook and this would not change as a result of the Modification (Heritage Computing, 2012). Therefore the Modification would not result in an increase in groundwater flux of more saline groundwater from the Permian system to the alluvium and so would not impact the long-term average salinity of Wollombi Brook.

On this basis, it is assessed that the Modification adequately satisfies the water quality minimal impact considerations relating to highly productive alluvial water sources defined in the AIP and outlined in Table A2-1.

Porous Rock Water Quality Minimal Impact Considerations

The water quality minimal impact considerations for aquifer interference activities within less productive porous rock water sources are presented in Table A2-1 and relate to impacts to groundwater quality in relation to the beneficial use category of the groundwater source.

The Modification would result in local depressurisation of the Permian groundwater system during mining (Heritage Computing, 2012). Following completion of mining recovery of the groundwater level is predicted to reach an equilibrium level lower than the pre-mining level (Heritage Computing, 2012).

In consideration of this, there is not expected to be a migration of groundwater away from the Modification area in the Permian system either during mining or following completion of mining activities. On this basis, the Modification would not lower the beneficial use category of the groundwater within the Permian system.

Therefore it is assessed that the Modification adequately satisfies the water quality minimal impact considerations relating to less productive alluvial water sources defined in the AIP and outlined in Table A2-1.